Scientific American.

A JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, AGRICULTURE, CHEMISTRY, AND MANUFACTURES.

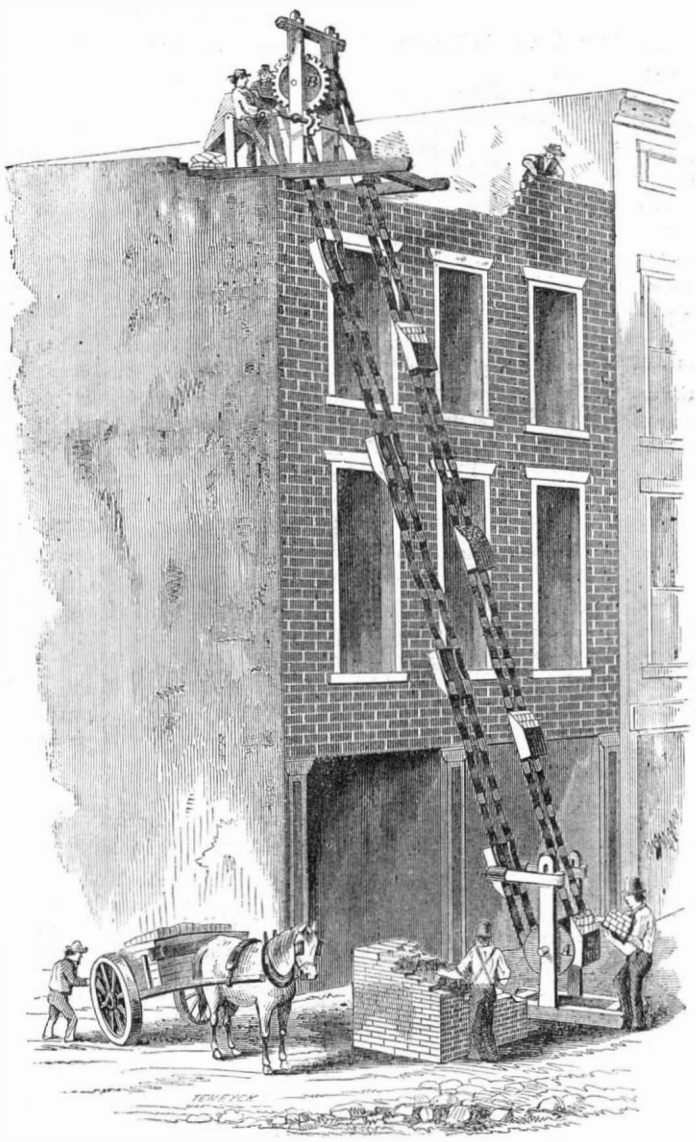
VOL. III.—No. 22. NEW YORK, NOVEMBER 24, 1860. NEW SERIES.

A NEW BRICK AND MORTAR ELEVATOR.

There is no operation in all the arts in which the waste of labor is more palpable than that of carrying up brick and mortar in erecting buildings. In order to raise 40 or 50 pounds, the hod carrier is required to exert muscular effort to raise his own weight (some 150 pounds) in addition, thus involving a waste of about three-fourths of the power expended. Several plans have been devised to economise the power required in this operation, and the one which we here illustrate is now in practical use in this city. It is so plainly shown by the engraving as hardly to require description.

An endless chain, formed of iron links, passes around two pulleys, one, A, at the ground, and the other, B, at the top of the wall. The pulleys have spurs which take into holes in the belt to prevent slipping, and the upper pulley is furnished with a crank for turning it. Hoppers are secured upon the upper side of the belt for receiving the brick, and as the wall rises, the belt is lengthened by the insertion of additional links, which are furnished with hooks so that this may be readily done.

The patent for this invention has been granted to the inventor, Thomas F. Christman, of Wilson, N. C., and further information in relation to it may be obtained by addressing James M. Edney, at No. 147 Chambers-street, this city.



CHRISTMAN'S IMPROVED BRICK ELEVATOR.

SINGULAR PROPERTIES OF WAY'S ELECTRIC LIGHT.

The following facts in regard to Way's electric light, which is now attracting so much attention, we find in the London *Photographic News*:—

A brief account of Professor Way's electric light was given in a recent number of the *Photographic News* (No. 106, page 230), and from the interest which was created by our notes on the subject we think our readers will be pleased to know the results of some investigations on the subject of the mercury light in its relation to color and photographic effect, which Mr. Crookes has recently made known. The light which is obtained from the fluid mercury poles in Professor Way's arrangement is of a very peculiar character, unlike the ordinary electric light, which, as our readers are aware, is produced between two carbon poles, and contains at least as many different colored rays as sunlight itself, the mercurial light consists of only six definite homogeneous colors, each occupying a particular space in the solar spectrum, and having wide black intervals between them. The carbon electric light will thus illuminate any object with the exact color which it is best able to reflect; but with the mercury light it is Hobson's choice, the object must either reflect one of the six colors evolved by the light, or it must remain in darkness. The colors are as follows:—First, at the lowest end of the spectrum comes a brick red tint, next to this is a strong yellowish orange, then two emerald green colors nearly touching; after these, and at some distance off, is a rich ultramarine blue, and lastly a violet. So far relates to color, but the rays evolved from the luminous mercury do not end here. Beyond the violet is another intensely energetic ray, but which, to be rendered apparent to the limited range of the eye, must be received upon some fluorescent screen, such as a piece of paper washed over with a solution of sulphate of quinine, or allowed to fall on a sensitive collodion plate. This latter surface makes known to us some other interesting properties of this light. Not only will this invisible ray impress itself strongly upon the plate, but the last two visible colors, viz., the rich ultramarine blue and the violet are also seen to rival it in photographic action. If (as has been done by Mr. Crookes) a more complicated arrangement be employed, and the light be decomposed and refracted into its component parts and thrown upon the collodion plate without having passed through glass at all, as may be effected by having the prisms and lenses cut from pure rock crystal, further remarkable results are obtained. Beyond this one invisible chemical ray are seen others equally energetic in their actinic power, and mounting higher and higher into the almost unknown regions of this invisible and mysterious part of the spectrum. The mercurial electric light thus appears to be almost unique in its properties, unlike other artificial lights it is pre-eminently distinguished by the intensity and number of its photographic rays, and although in its present state it will scarcely do for private or general purposes of house illumination, there is no reason why it may not become at once available for photographers. The reasons which will prevent it coming at present into general use are obvious from the above. Let any one imagine an assembly being illuminated with a light which is deficient in 94 per cent of those colored rays which are usually met with in sunlight. Only those colors would be visible which were capable of reflecting the identical ray of the spectrum contained in the mercury light, and everything else, of whatever color it might be by daylight, would be totally black. Instead of having a thousand varied hues and tints to rest the eye upon, we should be limited to the six colors named above, and their combinations; and any one who has considered for a moment how intimately any system of internal illumination depends for its success upon the facility of reflecting and showing up varieties of colors and tints, will at once see that a source of light, however brilliant and valuable, could scarcely meet with private or public approbation if it were so signally deficient in discrimination as to transform the warm glow of health on a fair girl's cheek, to the ghastly and cadavorous hue of death. Whilst raising these objections against the mercurial light for private or domestic purposes of illumination, we cannot but think that for photographic purposes it would be invaluable. Containing as it does so many and intense photographic rays, and having such advantages over the ordinary form of electric lamp, we wait with impatience the further developments and improvements which will be necessary before it can be brought before the public

SMOKE FROM GAS LIGHTS.—We take the following truthful remarks from our excellent cotemporary, the Philadelphia *Ledger*:—It is pretty generally supposed that the smoking of ceilings is occasioned by impurity in the gas; whereas, in this case, there is no connection between the deposition of soot and the quality of the gas. The evil arises either from the flame being raised so high that some of its forked points give out smoke, or more frequently from a careless mode of lighting. If, when lighting the lamps, the stopcock be opened suddenly, and a burst of gas be permitted to escape before the match be applied to light it, then a strong puff follows the lighting of each burner, and a cloud of smoke rises to the ceiling. This, in many houses and shops, is repeated daily, and the inevitable consequence is a blackened ceiling. In some houses the glasses are taken off and wiped every day, and before they are put on again, the match is applied to the tip of the burner, and the stopcock cautiously opened, so that no more gas escapes than is sufficient to make a ring of blue flame; the glasses being then put on quite straight, the stopcocks are gently turned until the flames stand out at three inches high. When this mode of management is pursued, few chimney glasses will be broken, and the ceilings will not be blackened for years.

THERE is to be a grand trial of steam fire engines at the celebrated tall pole, West Broadway, this city, on Thanksgiving Day, the 29th inst. It is stated that six different engine companies have already agreed to take part in the squirting tournament.

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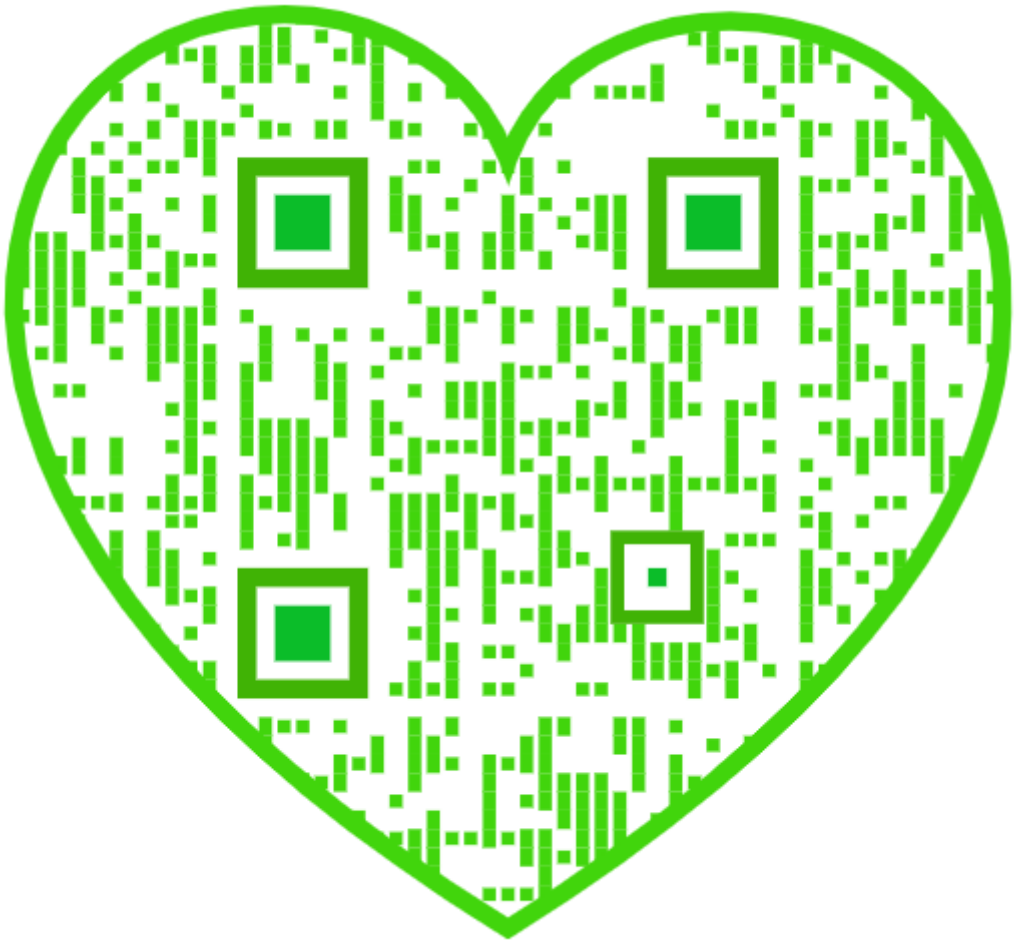


SCIENCE MADE POPULAR.

PROFESSOR FARADAY'S LECTURES ON THE PHYSICAL FORCES.

LECTURE VI.—THE CORRELATION OF THE PHYSICAL FORCES.

We have frequently seen, during the course of these lectures, that one of those powers or forces of matter of which I have written the names on that board has produced results which are due to the action of some other force. Thus, you have seen the force of electricity acting in other ways than in attracting; you have also seen it combine matters together or disunite them by means of its action on the chemical force; and in this case, therefore, you have an instance in which these two powers are related. But we have other and deeper relations than these; we have not merely to see how it is that one power affects another—how the force of heat affects chemical affinity, and so forth, but we must try and comprehend what relation they bear to each other, and how these powers may be changed one into the other; and it will to-day require all my care, and your care, too, to make this clear to your minds. I shall be obliged to confine myself to one or two instances, because to take in the whole extent of this mutual relation and conversion of forces would surpass the human intellect.

In the first place, then, here is a piece of fine zinc foil, and if I cut it into narrow strips and apply to it the power of heat, admitting the contact of air at the same time, you will find that it burns; and then, seeing that it burns, you will be prepared to say that there is chemical action taking place. You see all I have to do is to hold the piece of zinc at the side of the flame so as to let it get heated, and yet to allow the air which is flowing into the flame from all sides to have access to it: there is the piece of zinc burning just like a piece of wood, only brighter. A part of the zinc is going up into the air in the form of that white smoke, and part is falling down on to the table. This, then, is the action of chemical affinity exerted between the zinc and the oxygen of the air. I will show you what a curious kind of affinity this is by an experiment which is rather striking when seen for the first time. I have here some iron filings and gunpowder, and will mix them carefully together, with as little rough handling as possible; now we will compare the combustibility, so to speak, of the two. I will pour some spirit of wine into a basin, and set it on fire; and, having our flame, I will drop this mixture of iron filings and gunpowder through it, so that both sets of particles will have an equal chance of burning. And now tell me which of them it is that burns. You see a plentiful combustion of the iron filings; but I want you to observe that, though they have equal chances of burning, we shall find that by far the greater part of the gunpowder remains untouched; I have only to drain off this spirit of wine and let the powder which has gone through the flame dry, which it will do in a few minutes, and I will then test it with a lighted match. So ready is the iron to burn that it takes, under certain circumstances, even less time to catch fire than gunpowder. [As soon as the gunpowder was dry, Mr. Anderson handed it to the lecturer, who applied a lighted match to it, when a sudden flash showed how large a proportion of gunpowder had escaped combustion when falling through the flame of alcohol.]

These are all cases of chemical affinity, and I show them to make you understand that we are about to enter upon the consideration of a strange kind of chemical affinity, and then to see how far we are enabled to convert this force of affinity into electricity or magnetism, or any other of the forces which we have discussed. Here is some zinc (I keep to the metal zinc, as it is very useful for our purpose), and I can produce hydrogen gas by putting the zinc and sulphuric acid together, as they are in that retort; there you see the mixture which gives us hydrogen—the zinc is pulling the water to pieces and setting free hydrogen gas. Now we have learned by experience that if a little mercury is spread over that zinc it does not *take away* its power of decomposing the water, but *modifies* it most curiously. See how that mixture is now boiling; but when I add a little mercury to it, the gas ceases to come off. We have now scarcely a bubble of hydrogen set free, so that the action is suspended for the time. We have not *destroyed* the power of chemical affinity, but modified it in a wonderful and beautiful manner. Here are some pieces of zinc covered with mercury, exactly in the same way as the zinc in that retort is covered; and if I put this plate into sulphuric acid I get no gas, but this most extraordinary thing occurs, that if I introduce along with the zinc another metal which is *not* so combustible, then I reproduce all the action. I am now going to put to the amalgamated zinc in this retort some portions of copper wire (copper not being so combustible a metal as the zinc), and observe how I get hydrogen again, as in the first instance; there, the bubbles are coming over through the pneumatic trough, and ascending faster and faster in the jar; the zinc now is acting by reason of its contact with the copper.

Every step we are now taking brings us to a knowledge of new phenomena. That hydrogen which you now see coming off so abundantly does not come from the zinc, as it did before, *but from the copper*. Here is a jar containing a solution of copper. If I put a piece of this amalgamated zinc into it, and leave it there, it has scarcely any action; and here is a plate of platinum which I will immerse in the same solution, and might leave it there for hours, days, months or even years, and no action would take place; but, by putting them both together, and allowing them to touch (Fig. 44), you see

Fig.44

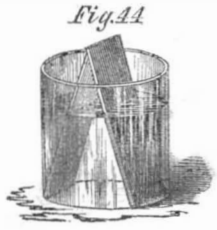
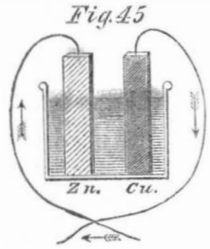


Fig.45



what a coating of copper there is immediately thrown down on the platinum. Why is this? The platinum has no power of itself to reduce that metal from that fluid, but it has, in some mysterious way, received this power by its contact with the metal zinc. Here, then, you see a strange transfer of chemical force from one metal to another; the chemical force from the zinc is transferred and made over to the platinum by the mere association of the two metals. I might take, instead of the platinum, a piece of copper or of silver, and it would have no action of its own on this solution; but the moment the zinc was introduced and touched the other metal, then the action would take place and it would become covered with copper. Now, is not this most wonderful and beautiful to see? We still have the identical chemical force of the particles of zinc acting, and yet, in some strange manner, we have power to make that chemical force, or something it produces, travel from one place to another; for we do make the chemical force travel from the zinc to the platinum by this very curious experiment of using the two metals in the same fluid in contact with each other.

Let us now examine these phenomena a little more closely. Here is a drawing (Fig. 45) in which I have represented a vessel containing the acid liquid and the slips of zinc and platinum or copper, and I have shown them touching each other *outside* by means of a wire coming from each of them (for it matters not whether they touch in the fluid or outside; by pieces of metal attached, they still, by that communication between them, have this power transferred from one to the other). Now if, instead of only using one vessel, as I have shown there, I take another, and another, and put in zinc and platinum, zinc and platinum, zinc and platinum, and connect the platinum of one vessel with the zinc of another, the platinum of this vessel with the zinc of that, and so on, we should only be using a series of these vessels instead of one. This we have done in that arrangement which you see behind me. I am using what we call a "Grove's voltaic battery," in which one metal is zinc and the other platinum; and I have as many as forty pairs of these plates all exercising their force at once in sending the whole amount of chemical power there evolved through these wires under the floor and up to these two rods coming through the table. We need do no more than just bring these two ends in contact when the spark shows us what power is present; and what a strange thing it is to see that this force is brought away from the battery behind me, and carried along through these wires! I have here an apparatus (Fig. 46) which Sir Humphrey Davy constructed many

Fig.46

years ago, in order to see whether this power from the voltaic battery caused bodies to attract each other in the same manner as the ordinary electricity did. He made it in order to experiment with his large voltaic battery, which was the most powerful then in existence. You see there are in this glass jar two leaves of gold, which I can cause to move to and fro by this rackwork. I will connect each of these gold leaves with separate ends of the battery, and if I have a sufficient number of plates in the battery, I shall be able to show you that there will be some attraction between those leaves even before they come in contact; if I bring them sufficiently near when they are in communication with the ends of the battery, they will be drawn gently together; and you will know when this takes place, because the power will cause the gold leaves to burn away, which they could only do when they touched each other. Now I am going to cause these two leaves of gold to approach gradually, and I have no doubt that some of you will see that they approach before they burn, and those who are too far off to see them approach will see by their burning that they have come together. Now they are attracting each other, long before the connection is complete; and there they go! burned up in that brilliant flash, so strong is the force. You thus see, from the attractive force at the two ends of this battery, that these are really and truly electrical phenomena.

Now let us consider what is this spark. I take these two ends and bring them together, and there I get this glorious spark like the sunlight in the heavens above us. What is this? It is the same thing which you saw when I discharged the large electrical machine, when you saw a single bright flash; it is the same thing, only *continued*, because here we have a more effective arrangement. Instead of having a machine which we are obliged to turn for a long time together, we have here a *chemical* power which sends forth the spark; and it is wonderful and beautiful to see how this spark is carried about through these wires. I want you to perceive, if possible, that this very spark and the heat it produces (for there is heat) is neither more nor less than the chemical force of the zinc—its *very* force carried along wires and conveyed to this place. I am about to take a portion of the zinc and burn it in oxygen gas for the sake of showing you the kind of light produced by the actual combustion in oxygen gas of some of this metal. [A tassel of zinc foil was ignited at a spirit lamp and introduced into a jar of oxygen, when it burned with a brilliant light.] That shows you what the affinity is when we come to consider it in its energy and power. And the zinc is being burned in the battery behind me at a much more rapid rate than you see in that jar, because the zinc is there dissolving and *burning*, and produces here this great electric light. That very same power which in that jar you saw evolved from the actual combustion of the zinc in oxygen is carried along these wires and made evident here; and you may, if you please, consider that the zinc is burning in those cells, and that *this* is the light of that burning [bringing the two poles in contact, and showing the electric light]; and we might so arrange our apparatus as to show that the amounts of power evolved in either case are identical. Having thus obtained power over the chemical force, how wonderfully we are able to convey it from place to place! When we use gunpowder for explosive purposes, we can send into the mine chemical affinity by means of this electricity; not having provided fire beforehand, we can send it in at

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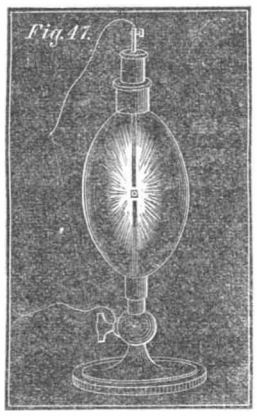
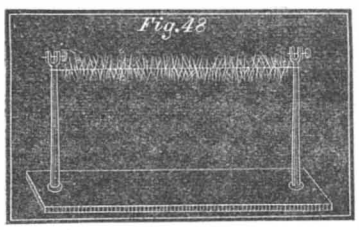
the moment we require it. Now, here (Fig. 47) is a vessel containing two charcoal points, and I bring it forward as an illustration of the wonderful power of conveying this force from place to place. I have merely to connect these by means of wires to the opposite ends of the battery and bring the points in contact. See what an exhibition of force we have! We have exhausted the air so that the charcoal cannot burn, and therefore the light you see is really the burning of the zinc in the cells behind me; there is no disappearance of the carbon, although we have that glorious electric light; and the moment I cut off the connection it stops. Here is a better instance to enable some of you to see the certainty with which we can convey this force where, under ordinary circumstances, chemical



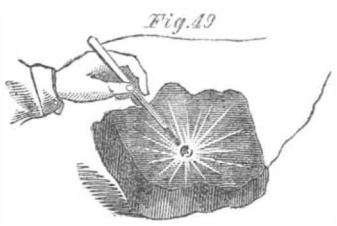
affinity would not act. We may absolutely take these two charcoal poles down under water, and get our electric light there. There they are in the water, and you observe, when I bring them into connection, we have the same light as we had in that glass vessel.

Now, besides this production of light, we have all the other effects and powers of burning zinc. I have a few wires here which are not combustible, and I am going to take one of them (a small platinum wire) and suspend it between these two rods which are connected with the battery, and when contact is made at the battery, see what heat we get (Fig. 48). Is not that beau-

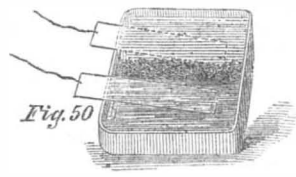


tiful? It is a complete bridge of power. There is metallic connection all the way round in this arrangement, and where I have inserted the platinum, which offers some resistance to the passage of the force, you see what an amount of heat is evolved; this is the heat which the zinc would give if burned in oxygen; but, as it is being burned in the voltaic battery, it is giving it out at this spot. I will now shorten this wire for the sake of showing you that the shorter the obstructing wire is, the more and more intense is the heat, until at last our platinum is fused and falls down, breaking off the circuit.

Here is another instance: I will take a piece of the metal silver and place it on charcoal connected with one end of the battery, and lower the other charcoal pole on to it. See how brilliantly it burns (Fig. 49). Here



is a piece of iron on the charcoal: see what a combustion is going on; and we might go on in this way, burning almost everything we place between the poles. Now I want to show you that this power is still chemical affinity; that if we call the power which is evolved at this point *heat*, or *electricity*, or any other name referring to its source, or the way in which it travels, we still find it to be chemical action. Here is a colored liquid which can show by its change of color the effects of chemical action; I will pour part of it into this glass, and you will find that these wires have a very strong action. I am not going to show you any effects of combustion or heat, but I will take these two platinum plates, and fasten one to the one pole and the other to the other end, and place them in this solution, and in a very short time you will see the blue color will be entirely destroyed. See: it is colorless now! I have merely brought the end of the wires into the solution of indigo, and the power of electricity has come through these wires and made itself evident by its chemical action. There is also another curious thing to be noticed now we are dealing with the chemistry of electricity, which is, that the chemical power which destroys the color is only due to the action on one side. I will pour some more of this sulphindigotic acid into a flat dish, and will then make a porous dike of sand, separating the two portions of fluid into two parts (Fig. 50); and now we shall be able to see whether there is any difference in the two ends of the battery, and which it is that possesses this peculiar action. You see it is the one on my right hand which has the power of destroying the blue, for the portion on that side is thoroughly



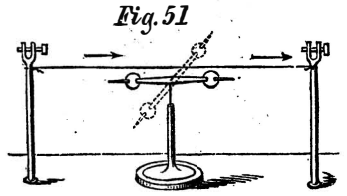
bleached, while nothing has apparently occurred on the other side. I say *apparently*, for you must not imagine that because you cannot perceive any action none has taken place.

Here we have another instance of chemical action. I take these platinum plates again and immerse them in this solution of copper, from which we formerly precipitated some of the metal when the platinum and zinc were both put in it together. You see that these two platinum plates have no chemical action of any kind; they might remain in the solution as long as I liked, without having any power of themselves to reduce the copper; but the moment I bring the two poles of the battery in contact with them, the chemical action which is there transformed into electricity and carried along the wires again becomes chemical action at the two platinum poles, and now we shall have the power appearing on the left hand side, and throwing down the copper in the metallic state on the platinum plate; and in this way I might give you many instances of the extraordinary way in which this chemical action or electricity may be carried about. That strange nugget of gold, of which there is a model in the other room, and which has an interest of its own in the natural history of gold, and which came from Ballarat, and was worth £8,000 or £9,000 when it was melted down last November, was brought together in the bowels of the earth—perhaps ages and ages ago—by some such power as this. And there is also another beautiful result dependent upon chemical affinity in that fine lead tree, the lead growing and growing by virtue of this power. The lead and the zinc are combined together in a little voltaic arrangement in a manner far more important than the powerful one you see here, because, in nature, these minute actions are going on forever, and are of great and wonderful importance in the precipitation of metals and formation of mineral veins, and so forth. These actions are not for a limited time, like my battery here, but they act forever in small degrees, accumulating more and more of the results.

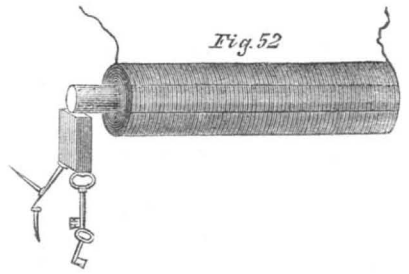
I have here given you all the illustrations that time will permit me to show you of chemical affinity producing electricity, and electricity again becoming chemical affinity. Let that suffice for the present; and now let us go a little deeper into the subject of this chemical force or this electricity—which shall I name first?—the one producing the other in a variety of ways. These forces are also wonderful in their power of producing another of the forces we have been considering, namely, that of magnetism; and you know that it is only of late years, and long since I was born, that the discovery of the relations of these two forces of electricity and chemical affinity to produce magnetism have become known. Philosophers had been suspecting this affinity for a long time, and had long had great hopes of success; for, in the pursuit of science, we first start with hopes and expectations; these we realize and establish, never again to be lost, and upon them we found new expectations of farther discoveries; and so go on pursuing, realizing, establishing, and founding new hopes again and again.

Now observe this: here is a piece of wire which I am about to make into a bridge of force; that is to say, a communicator between the two ends of the battery. It is copper wire, only, and is therefore not magnetic of itself. We will examine this wire with our magnetic needle (Fig. 51), and, though connected with one ex-

Fig. 51



treme end of the battery, you see that before the circuit is completed it has no power over the magnet. But observe it when I make contact; watch the needle; see how it is swung round; and notice how indifferent it becomes if I break contact again: so, you see, we have this wire evidently affecting the magnetic needle under these circumstances. Let me show you that a little more strongly. I have here a quantity of wire which has been wound into a spiral, and this will affect the magnetic needle in a very curious manner, because, owing to its shape, it will act very like a real magnet. The copper spiral has no power over that magnetic needle at present; but if I cause the electric current to circulate through it, by bringing the two ends of the battery in contact with the ends of the wire which forms the spiral, what will happen? Why, one end of the needle is most powerfully drawn to it; and if I take the other end of the needle, it is repelled; so, you see, I have produced exactly the same phenomena as I had with the bar magnet, one end attracting and the other repelling. Is not this, then, curious to see that we can construct a magnet of copper? Furthermore: if I take an iron bar and put it inside the coil, so long as there is no electric current circulating round, it has no attraction, as you will observe if I bring a little iron filings or nails near the iron. But now, if I make contact with the battery, they are attracted at once. It becomes at once a powerful magnet, so much so that I should not wonder if these magnetic needles on different parts of the table pointed to it. And I will show you, by another experiment, what an attraction it has. This piece and that piece of iron, and many other pieces, are now strongly attracted (Fig. 52); but, as



soon as I break contact, the power is all gone, and they fall. What, then, can be a better or a stronger proof than this of the relation of the powers of magnetism and electricity? Again: here is a little piece of iron which is not yet magnetized. It will not, at present, take up any one of these nails; but I will take a piece of wire and coil it round the iron (the wire being covered with cotton in every part it does not touch the iron), so that the current must go round in this spiral coil; I am, in fact, preparing an *electro-magnet* (we are obliged to use such terms to express our meaning, because it is a magnet made by electricity—because we produce by the force of electricity a magnet of far greater power than a permanent steel one). It is now completed, and I will repeat the experiment which you saw the other day, of building up a bridge of iron nails: the contact is now made, and the current is going through; it is now a powerful magnet; here are the iron nails which we had the other day, and now I have brought this magnet near them they are clinging so hard that I can scarcely move them with my hand (Fig. 53). But

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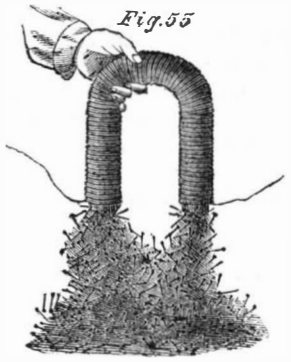
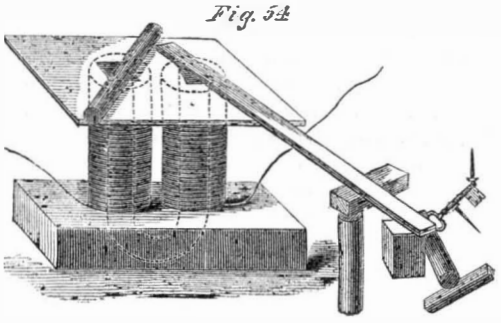
when the contact is broken, see how they fall. What can show you better than such an experiment as this the magnetic attraction with which we have endowed these portions of iron? Here, again, is a fine illustration of this strong power of magnetism. It is a magnet

Fig. 55



of the same sort as the one you have just seen. I am about to make the current of electricity pass through the wires which are around this iron for the purpose of showing you what powerful effects we get. Here are the poles of the magnet; and let us place on one of them this long bar of iron. You see, as soon as contact is made, how it rises in position (Fig. 54); and if I take such a piece as this cylinder, and place it on, woe be to me if I get my finger between; I can roll it over, but if I try to pull it off, I might lift up the whole magnet, but I have no power to overcome the magnetic power which is here evident. I might give you an infinity of illustrations of this high magnetic power. There is that long bar of iron held out, and I have no doubt that, if I were to examine the other end, I should

Fig. 54



find that it was a magnet. See what power it must have to support not only these nails, but all those lumps of iron hanging on to the end. What, then, can surpass these evidences of the change of chemical force into electricity, and electricity into magnetism? I might show you many other experiments whereby I could obtain electricity and chemical action, heat and light from a magnet, but what more need I show you to prove the universal correlation of the physical forces of matter, and their mutual conversion one into another?

And now let us give place as juveniles to the respect we owe to our elders, and for a time let me address myself to those of our seniors who have honored me with their presence during these lectures. I wish to claim this moment for the purpose of tendering our thanks to them, and my thanks to you all for the way in which you have borne the inconvenience that I at first subjected you to. I hope that the insight which you have here gained into some of the laws by which the universe is governed may be the occasion of some among you turning your attention to these subjects; for what study is there more fitted to the mind of man than that of the physical sciences? And what is there more capable of giving him an insight into the actions of those laws, a knowledge of which gives interest to the most trifling phenomena of nature, and makes the observing student find

"Tongues in trees, books in the running brooks,
Sermons in stones, and good in everything?"

PATENT OFFICE REPORTS FOR 1859.—We are indebted to John Heart, Esq., Superintendent of the Public Printing, for copies of the mechanical report of the Patent Office for 1859. It consists of two volumes, one devoted to the claims and one to the illustrations. In a recent number we referred to the excellent manner in which the illustrations were executed, and it only remains now to say that the whole report is very satisfactorily done. The arrangement is much better than heretofore.

A NEW TYPE METAL.

Every person who has ever cast bullets knows that lead shrinks in cooling, forming a depression or hollow in the neck which sometimes extends down into the ball. This property of contracting on changing from the liquid to the solid state is common to nearly all the metals with two remarkable exceptions—iron and antimony, which expand in solidifying. This property renders these metals peculiarly adapted to casting, as it causes them to fill the mold and thus produce a perfect copy of the pattern. For this reason, antimony is employed to form the alloy for casting type, the standard proportion in England being 3 lbs. of lead to 1 lb. of antimony. Antimony is much harder than lead; but as it is worth from 14 to 17 cents per pound, while lead ranges from 5 to 7 cents, rival manufacturers are apt to accuse each other of producing an inferior article by forming their alloy with too large a proportion of lead.

It is now quite common to coat the face of type with copper by the galvanic process, and an impressive proof of the extreme delicacy and evenness of this deposit is furnished by the fact that it is only in very nice work that even the fine lines of the type are found to be impaired by the copper coating. Copper faced type is far more durable than that which is not so faced, and is extensively used.

Type is formed by being cast in molds. The bottom of the mold, for the face of the type, is formed by punching a steel die into a bar of copper, called a matrix, and the mold for the body of the type is formed of movable iron or steel plates adjusted above the copper bar. The mold is held up horizontally against the face of the reservoir of melted metal, when, by turning a crank, an opening is made, and a little pump drives the proper quantity of metal into the mold. The smallest sized type in use is called diamond, 205 lines of which are contained in a foot, or 17 1-12th lines in an inch. There are 14 sizes of type in common use, the names of which, with the number of lines of each to the foot, are as follows:—

Double pica	41⅓	Bourgeois	102¼
Paragon	44⅓	Brevier	112⅝
Great Primer	51⅓	Minion	128
English	64	Nonpareil	143
Pica	71⅓	Agate	166
Small pica	83	Pearl	178
Long Primer	89	Diamond	205

This article is printed in brevier, and the patent claims on another page in agate.

A new alloy for casting type is just being introduced by James Conner & Sons, of this city, which is likely to prove vastly superior to the ordinary type metal. We are having a font cast from the new metal for this paper, and on the 1st of January we shall appear before our readers in an entirely new dress.

CAR AND LOCOMOTIVE COMBINED.

MESSRS. EDITORS:—Mr. Geo. W. Cass, President of the Pittsburgh, Fort Wayne and Chicago Railroad, has just made an experimental trip to Chicago with the new locomotive iron car, which was built by Russell & Co., of Massilon, Ohio, under the patent of Moore & Young. The experimental trip was a perfect success. The extreme length of the car is 77 feet; weight, 16 tuns; weight, when provided with fuel and water, 19 tuns and 20 lbs. The capacity of carrying is seats for 98 passengers. The car ran at the rate of 45 miles per hour upgrades of 50 feet to the mile. You will no doubt be glad to record the success of a car and locomotive combined. The improvement is valuable to all short lines of railroad, and roads using portions of their lines only for accommodation trains. J. H. D.

Pittsburgh, Pa., November 15, 1860.

CARROTS FOR HORSES.—The *American Stock Journal* says:—"The carrot is the most esteemed of all roots for its feeding qualities. When analyzed, it gives but little more solid matter than other roots, 85 per cent being water; but its influence in the stomach upon the other articles of food is most favorable, conducing to the most perfect digestion and assimilation. The result, long known to practical men, is explained by chemists as resulting from the presence of a substance called *vectine*, which operates to coagulate or gelatinize vegetable solutions, and this favors digestion in all cattle. Horses are especially benefitted by the use of carrots. They should be fed to them frequently with their other food."

HYDRO-ELECTRIC APPARATUS

In answer to a correspondent, we will describe a steam electrical machine. It is made with a small steam boiler insulated on glass legs, and having on its top a small tube, crossed with another pipe filled with little holes tipped with pieces of hard wood. Opposite to these orifices, but entirely separate from the boiler, is placed a box containing a great number of metal points connected with a conductor. Attached to the metal of the boiler opposite the steam jets is a horizontal iron rod, mounted with a brass ball, which collects the excited electricity from the boiler as the points carry off the opposite electricity. The sparks obtained from the brass ball of the boiler are dense and rapid, and almost produce a continuous sheet of light. This machine was the result of an accidental discovery in 1840, by an engineer in Newcastle, who, while putting forth his hand to stop a small leak in a safety valve, received a severe electrical shock. Mr. Wm. Armstrong (now Sir William, inventor of the Armstrong gun) heard of the circumstance, was led to investigate it, and this led to the invention of his "hydro-electric machine." The electricity is the same as that produced by the glass frictional machine.

IMPORTANT EXPERIMENTS WITH STEAM.—The Secretary of the Navy has ordered a Board of Naval Engineers, consisting of Chief Engineers Isherwood, Zellen, Long and Stimers, to meet on board the United States steamer *Michigan*, in the harbor of Erie, Pa., on the 19th inst., for the purpose of making a careful set of experiments as to the practical advantages of using steam expansively, and any person engaged in the manufacture or management of steam engines, who may present themselves on board for the purpose of witnessing the experiments, will be afforded every reasonable facility for so doing.

[This paragraph appeared in the *Herald* of the 14th inst., and as it did not afford sufficient notice to those who feel a deep interest in this subject, we addressed a letter to the Secretary of the Navy, urging him to postpone the time for beginning the experiments, at least ten days. At the time of going to press we had not received Mr. Toucey's reply.

IMPORTANT TO MEAT PACKERS.—The Commissioner of Patents to-day issued a patent to Hon. D. E. Somes, of Maine, for packing and curing meats in warm climates, destined to produce remarkable results, not only in this country, but in Central and South America, where the curing of meats has heretofore been impossible. The *modus operandi* of this invention is simple and cheap, consisting of sinking shafts into the earth sufficiently deep to obtain the minimum of mean temperature, and aided in the hottest climates by artificial refrigerators. These shafts constitute subterranean packing houses, where meat remains until sufficiently cured for market.

[We find the above announcement in the telegraphic news of the *Herald*. We wonder if it would be any infringement of this patent to dig a deep cellar in some southern climate and then put meat into it; or would it infringe the patent to store up meat in a coal mine, or suspend it in a well? We wonder if this patent was issued under the "watch and care" of the Revisionary Board?

MANGANESE IN PENNSYLVANIA.—It is said that a rich deposit of manganese has recently been discovered in Maxatawny township, Berks county, Pa. The land belongs to a German farmer named John Kohler, and has been leased by parties who have contracted with a New York firm to deliver to them all the manganese which the place will yield. It is of superior quality, and the deposit is very extensive, at some points commencing four feet below the surface, and, as far as ascertained, seventy-five feet in depth. With the exception of an inferior article found in Vermont, the manganese used in the United States is mainly imported from Bohemia, Saxony, France, England, and other countries. Manganese is a mineral used in the bleaching of muslin, linen, &c.; by potters for glazing their ware, and by glass manufacturers to obliterate discolorations produced by sesquioxyd of iron; and for many other purposes.

AN IRON PALACE.—The Pasha of Egypt is establishing a magnificent palace, built of French cast iron, for a museum of antiquities, to be filled with relics of antiquity, found in Egypt, in the execution of which 2,500 men are now employed, under the direction of Mariette, the French archæologist.

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PROTRACTING TRIGONOMETER.

The annexed engravings represent an improved instrument for protracting maps and for other uses of draughtsmen, recently invented and patented in the United States and in Great Britain by Josiah Lyman, who may be addressed in relation to it at Lenox, Mass.

Fig. 1 shows the scale plate in its true size and proportions, except in length. Accompanying the trigonometer is a draughting board with a metallic border, easily rendered, by its adjustments, *exactly rectangular*.

Fig. 2 gives a vertical view of the entire instrument, the parts being shown in their true proportions, except that the scale plate and rule are both represented as broken. The engraving is a little more than one-third the true size.

The metallic plate, E (Fig. 2), has a lip projecting downward from its straight edge, to be placed against the edge of the draughting board in the usual manner of this class of protractors, when the angle is measured by the position of the index upon the graduated arc.

The principal feature, however, in this invention is the arrangement for measuring the lengths of the lines. For this purpose, a graduated brass plate is fitted to slide upon the long arm or rule of the protractor, and upon this plate is a shorter one furnished with adjustable verniers, called a "guide." Fig. 1 represents a section of the rule with a slide upon it. The slide is placed with the proper one of its zero points (marked 8, 10, 12, 16, 20 or 24) at one end of the line, and the guide, C, is slipped with its edge to the other end of the line, when the length is indicated by the proper scale and vernier to the thousandths of an inch.

This beautiful instrument is a twofold achievement. While it is strictly a scientific combination—uniting in one instrument the protractor, draughting rule and sliding vernier scale plate—the accuracy and skill apparent in the arrangement and construction of its mechanism are a triumph in art. For such are the peculiarities of its construction, though simple, that it enables the operator completely to eliminate the unavoidable errors of manufacture, and hence actually to lay down upon paper the data furnished by his field notes, and measure the varied parts of his work with mathematical precision.

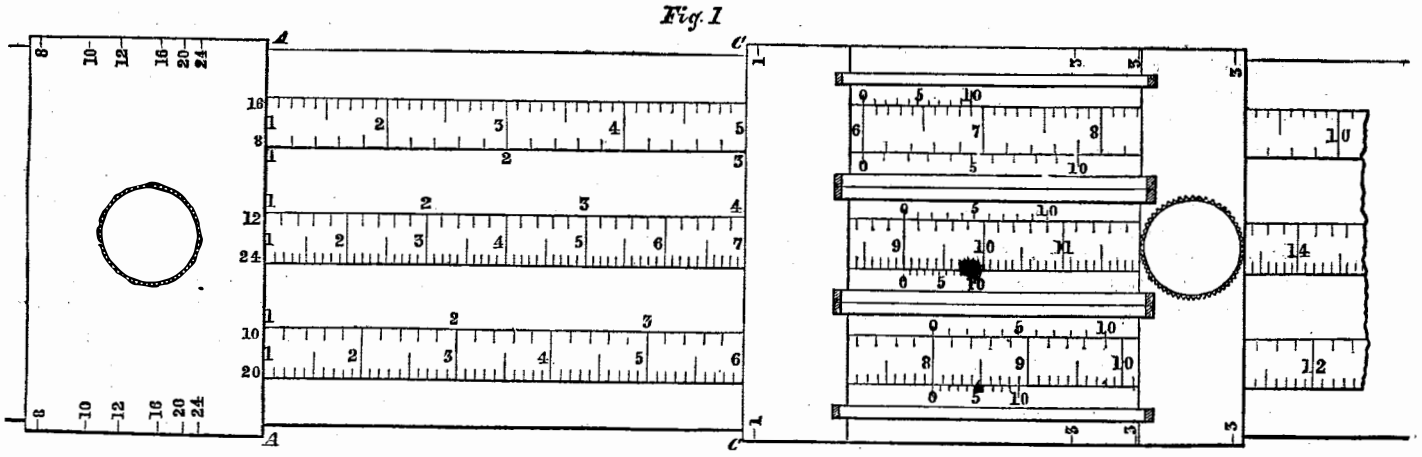
The protractor and rule are connected by a common pivot, the divisions on the limb of the former being made to half degrees. To the attached end of the latter is fastened an adjustable, double, direct vernier, reading to minutes. The given angle and its complement are obtained at one setting of the instrument, and each of them can be taken in *two positions* of its vernier: hence, an azimuth motion of 90° gives 180°; the bearing and reverse bearing of a line always having the same line of direction. Hence, also, by reversing the instrument, every angle may be tested. The scale plate is used on *either side* of the ruler, or *separately*, as occasion may require. In the common instruments, it has graduated upon it *six decimal scales*—the units being 10-8ths, 10-10ths, 10-12ths, 10-16ths, 10-20ths and 10-24ths of an inch.

On the scale plate of the best class of instruments there are graduated *nine* scales instead of *six*. This is done by merely bisecting the subdivisions of the three finer scales, changing the figuring and appending an additional vernier to each of the three corresponding vernier pieces. The units of the additional scales are 10-32ds, 10-40ths and 10-48ths of an inch. The 10-40th inch scale furnishes an even ratio between the inch and mile; the inch in this case representing 4, 40, 400, 4,000, 40,000, &c., chains. The French scale, with 5, 10 and 20 millimetres for the units, will be substituted for either of the systems above described whenever the demand shall require it. The same assurance is given in regard to any other scale which shall be largely demanded.

The trigonometor thus constructed is not only four times more reliable than the chain and compass, but furnishes the best means yet discovered for detecting their errors. It lays down or measures, at the same time, both the angle and distance, rendering unnecessary in all trigonometrical calculations to five decimal places the use of logarithms, and, in all cases, the traverse tables. It thus saves half the time and labor in the mensuration of all forms of triangles and trapeziums, areas of irregular fields, and of hights and distances. For all purposes of draughting the trigonometer is wholly unrivalled, and needs only to be known to render its use a necessity to every surveyor, architect, draughting machinist, map maker and teacher of these branches—in a word, to *every draughtsman*. And its cost is such as to place it within the reach of every practical man.

These facts are fully substantiated by the mathematicians, surveyors, teachers, &c., in various parts of the country who have had an opportunity to examine the instrument, among whom are the following:—Edmund Blunt, Esq., manufacturer of philosophical and astronomical instruments, and First Assistant in the United States Coast Survey; Professors Tatlock, Hopkins, Hubbard, Helsey, Snell and Curtis, of Massachusetts; Messrs. O. C. Wright, Z. Richards, C. H. Norton and A. C. Richards, of Washington, D. C.; Professor J. S. Benedict, Civil Engineer New York Free Academy; Professors H. A. Newton, W. H. Norton, C. S. Lyman and Alex'r C. Twining, of Connecticut; J. H. French, Esq., Superintendent of the New York State Map; George P. Bond, Esq., Observer at the Cambridge Observatory; Professor O. M. Mitchell, Director of the Cincinnati Observatory; mathematical instrument makers, delineators in the United States Coast Survey and Land Offices, as well as other practical surveyors, architects and distinguished teachers in various sections of the country.

Fig. 1



LYMAN'S IMPROVED PROTRACTING TRIGONOMETER.

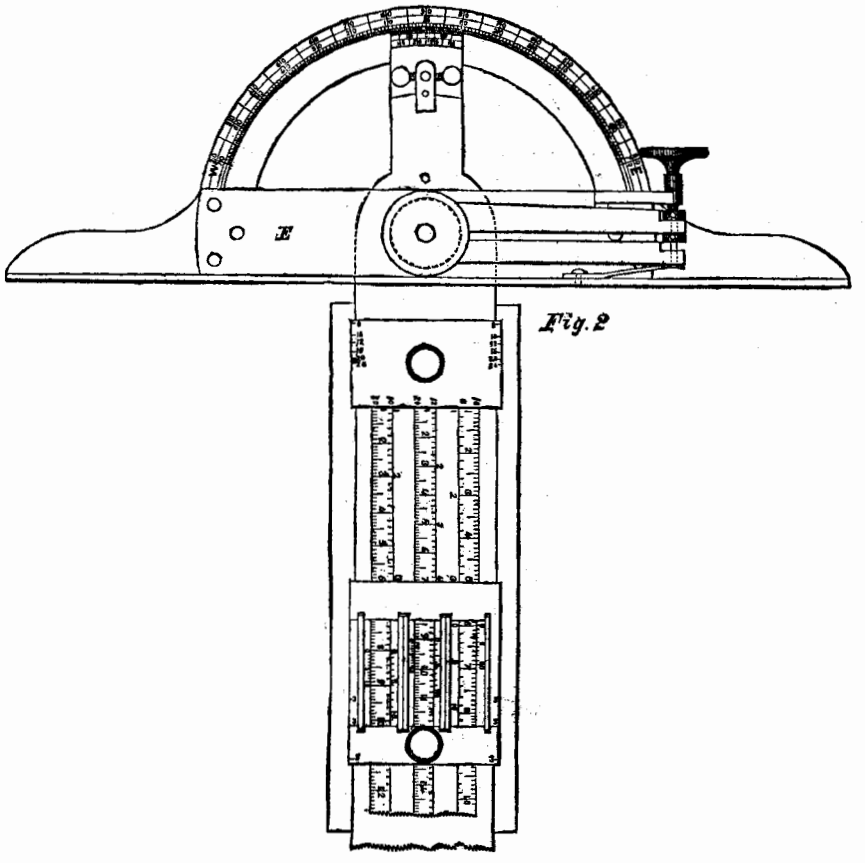


Fig. 2

DIFFICULTY OF DISTINGUISHING A PLANT FROM AN ANIMAL.

—The more naturalists know of the plants and animals of the globe, the more difficult have they found it to distinguish one from the other. Among the little organisms which are invisible to the naked eye, there are large numbers about the character of which there has long been a fierce dispute, they being claimed by the botanists as plants and by the zoologists as animals. Many of the plants in certain stages of their growth, swim about in the water and look and act so nearly like animals that they would probably have always been classed as such had they not been observed to branch out and grow up into perfect plants. There is no single character by which the animal or vegetable nature of an organism can be tested; but the safest guide in the doubtful cases is furnished by the mode in which the nourishment is taken. Animals are nourished by organic matter, which they take in some way into the interior of their bodies; while vegetables have the power of absorbing their food from inorganic elements on the exterior.

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LATE FOREIGN INVENTIONS.

Treating Oils for Paint and Varnish.—Drying oils (such as linseed which is employed for painting) become semi-resinous by absorbing oxygen when exposed to the air. In order to render them quick-drying, however, they require to be boiled for a considerable period, and some oxydizing agent is incorporated with them. "Boiled oil" which is prepared for painting is very troublesome to manufacture, and the process is quite tedious. An improved mode of treating such oil for making varnishes and for painting has lately been patented by F. Walton, of Denton, England. He takes clear linseed oil, mixes it with about five per cent of acetate of lead, then puts it into a vessel where it is forced by a pump into a great number of small streams, like a shower; then it meets with a current of warm, dry air raised to the temperature of steam heat, when it rapidly absorbs oxygen and acquires the same drying quality of boiled oil, but is much clearer in color and superior for most purposes. Sometimes the air is heated as high as 550° Fah., in order to facilitate the operations.

Bank Paper and Ink for Writing.—A peculiar preparation of paper and ink has lately been patented by J. A. Ballande, of Paris. He introduces into paper pulp about 30 per cent of proto-chloride of mercury (calomel), and the paper is ready for use. An ink is now made with 1,000 grains of alum, 50 grains of salammoniac and 50 grains hyposulphite of soda, mixed with a little gum mucilage. This ink will not become black unless used with paper prepared in the above manner. A dark color is produced when the hyposulphite of soda combines with the calomel; but this would soon fade were it not for the alum and alkaline salt in the ink—these fix it. No chemical means known to M. Ballande can remove the writing produced in this manner, without altering the texture of the paper. It is the best means believed to be yet discovered for preventing the alteration of important signatures, &c., in bank bills and other valuable papers. Any white paper may be sponged on the surface with a dilute solution of calomel, then dried, and is ready for use with the above ink; but the most perfect way of preparing the paper is undoubtedly in the pulp.

Cheap Bolting Cloths.—In order to supersede the expensive silk bolting cloths employed for bolting flour, by some cheaper and equally as good a material, a patent has been taken out by I. and L. Howard, of Bethnal Green, London, for a fabric made of woven glazed cotton thread. Common glazed or sewing cotton is woven in a loom to make bolting cloths of the same capacity as those made of other material. These cloths may be woven in the cylindrical form in which they are employed as bolts, or they may be made into a flat web in a common loom, and afterward cut out into the proper form. When such bolting cloth is made, it is dressed with a solution made with one pound of gum dissolved in a gallon of water. When dry, it is fit for use, and may also be employed for sieves as a cheap and very enduring fabric to supersede haircloth.

Coating Iron with India-rubber.—A peculiar method of coating iron with india-rubber and vulcanizing it has been patented by T. B. Daft, of London, whereby plates of iron so treated may be employed for shipbuilding, and have a most permanent and impermeable surface. The surface of the iron is first scoured bright with dilute sulphuric acid, sand and water; then sulphurized india-rubber is applied to the surface, and all the air is excluded. For this purpose, two thin sheets —one on each side—of india-rubber are applied to a sheet of iron four feet by fourteen inches, and the edges of them brought close together so as to seal up the iron between them. Before the sealing action is performed, however, all the air is excluded under the sheets by commencing at the middle and rolling them toward the edges, when the sheets are then united together. A pile of sheets being thus prepared, they are placed with a sheet of common tinned iron between each pair, then cramped and pressed tightly together and set into the vulcanizing chamber where they are subjected to high pressure steam, and the india-rubber thus becomes most permanently attached to the iron. Other articles of iron besides sheets may be coated with vulcanized india-rubber by following the above directions, with some modifications, which will easily suggest themselves.

Silicate of Soda Soap.—A patent has been taken out by Wm. Gossage, of Widnes, England, for making a strong alkaline soap mixed with the silicate of soda (soluble quartz). Two tuns of rosin and one of palm oil are melted in a suitable vessel, and heated to 180° Fah. In another vessel, an alkaline mixture of two tuns of silicate of soda solution and twenty-five hundred weight solution of caustic soda, containing 30 per cent of real soda. This mixture is then heated to 210° Fah. in a large iron vessel, and the rosin and palm oil mixture is introduced. A strong boiling action immediately ensues, a thorough mixture of all the substances is soon effected, and a strong detergent soap produced. This soap is allowed to remain for about twelve hours in the vessel before it is transferred to the frames to become solid by cooling.

New Material for Pencils.—Some black lead in powder mixed with india-rubber in solution, a small quantity of lampblack and some finely powdered charcoal, are incorporated together and subjected to great pressure. This forces out all the moisture and reduces the mixture to a hard block, which may be subdivided and cut out into suitable lengths for pencils. A patent has been taken out for this pencil composition by R. J. Cole, of London.

Pipe Clay Soap.—L. Rowbottom and H. Bolton, of Penketh, England, have obtained a patent for composite soap composed of caustic potash and ammonia made into a paste with pipe clay, and mixed with any of the common soaps, then formed into cakes. The patentees claim superior cleansing properties for this soap.

THE $1,000 PRIZE.

A WORD FROM MR. HYATT ABOUT THAT FLYING MACHINE.

MESSRS. EDITORS:—Allow me a small space in your paper to briefly answer a large number of your readers who write to ask of me money for their experiments. My apology for not sooner replying to these friends is that I have been absent in Kansas, engaged in behalf of 30,000 starving people there.

Now, as to the flying machine: I can advance no money for experiments, happy as I should be to oblige the many ingenious men, each of whom is perfectly sure that he alone of all the world has the exact method to do it.

I think I know how the thing can be done; and if I spend money in experiments, it will be upon my own plan; but I have too much else to see to at present. Nevertheless, I give the other inventors fair warning that, unless they get up towards the moon by September next, I shall "go in" myself. THADDEUS HYATT.

New York, November 12, 1860.

ELECTRICITY IN MAKING IRON.

MESSRS. EDITORS:—In regard to the practical working of my new iron refining process, now being patented here and in Europe, I can give you the following details:—

It is well known that there is no chemical compound existing which is able to withstand the decomposing power of electricity. Affinity of matter is modified, given and destroyed by electric action, and to this mighty power we must therefore look as the only ever-effective decomposing, recomposing and purifying agent. It is upon electric action (produced in a manner different from any previously employed) that my electric process is based. Not satisfied with my successful experiments on a small scale, I have now tested my process on a larger scale, on pig iron as well as cast iron, and the results have been beyond my expectation. For instance, I took old scrap iron (pieces of old burned out cast iron stoves and such iron as is sold here for from $10 to $12 per tun), and subjecting this iron without any admixture of cinders or pig iron to my process, I produced, in one single heat, malleable iron of such a nature that it was at once rolled into nail plates, a sample of which, as well as of the nails cut from the same, you will please find here inclosed. My apparatus is more especially adapted for puddling furnaces, and the cost of one, doing the work for eight or ten puddling furnaces, is not more than $500. The expense of keeping it at work is not more than 50 cents per day; the other extra expenses amounting to $1 50 per tun. No re-heating being required, no change of furnace, and the machinery so simple that every common workman is able to conduct the process, I see no reason why our iron manufacturers should not adopt at once this new and simple method. I am now making arrangements for the introduction of my process in a large blast furnace for the purpose of making malleable iron or steel directly from the ore, as also in a large nail manufacturing establishment, and I shall be pleased if you accept an invitation to see the process with your own eyes.

A. L. FLEURY, Chemist,
No. 543 Broadway.

New York, November 16, 1860.

MIND YOUR I's AND J's.

MESSRS. EDITORS:—I wish to call the attention of your numerous readers, especially inventors, their agents or attorneys, and writers generally, to the fact that a distinction between the script letters, I and J, is as essentially necessary as the distinction between 6 and 9. It is a mark of great carelessness or slovenliness in writing, to substitute, from mere caprice or habit, the one for the other, raising, as it invariably does, suspicion as to the culture or scholarship of such writer. This lazy substitution of letters often leads to misunderstandings and delays in specifications, deeds, wills, and other papers in script, as it often does not correspond with the more carefully printed letters in the drawings. It often causes delay, and sometimes bitter disputes, when, in the address to individuals, I is made to stand for Isaac, and also for James, Ira or John. Writing Ian for January, Iune for June, Ino. for John, &c., is not often misapprehended; but sometimes, when the context is obscure, the proper writing of this letter would determine the sense, and not leave us to speculate whether I stands for June, Judge, John, Isaac, Indigo or Iron.

Where initials are used for abbreviation, writers have no right to sacrifice the correct execution of a letter to the whim of what is vulgarly deemed taste or flourish, by not allowing the letter J to drop properly below the line of writing, its distinguishing feature, and which is the unalterable form in standard script letter.

The fault here cited has, in part, obtained from the old but false and whimsical mode practiced by not the best publishers and printers, of omitting, in our spelling books, the letter I or J, thereby leading children to think that the two letters are synonymous, than which a more unscholarly superstition never haunted the English alphabet.

It is a principle in abbreviations that the mode adopted be in all cases unmistakable; but when it happens, as it frequently does, that ignorance tramples upon this principle, and slipshod caprice adds to this abbreviation a leading letter that is undeniably wrong, the communication of ideas is utterly impossible. B.

Washington, D. C., November 7, 1860.

AGRICULTURAL INVENTIONS CALLED FOR.

MESSRS. EDITORS:—Having been for some time a constant reader of your valuable paper, I would suggest to the inventive genius of the country that there is a vast expanse as yet unexplored, awaiting the achievement of man. I am a farmer, have reaping and thrashing machines, and many other things that are really labor-saving implements; but yet we lack in some things. We want a machine to cock hay, drawn by horses in such position that, when at work, they will not walk on the hay. We also want a machine to table broom corn. It will need to be drawn by one horse to walk between two rows; then if any lies down it must stand it upright, so that the stalks may be broken at the right angle and hight, the table to hold the brush, as it is cut by the workmen, following, and put on the table to dry. This machine might be constructed mostly of wood, and come within the means of all broom corn growers. There are many men that raise their 100 tuns annually, and tabling is a very laborious back-aching business. An average day's work now is an acre, when, with a machine, a man and horse might table 10 acres per day easily.

P. W.

Romulusville, N. Y., November 10, 1850.

WE have the authority of Professor Agassiz for the assertion that a grasshopper's organs of hearing are in his legs.

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THE POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

[Reported expressly for the Scientific American.]

The usual weekly meeting was held on Thursday evening, November 8th—John Johnson, Esq., presiding.

MISCELLANEOUS BUSINESS.

Economy of the Caloric Engine.—Mr. Babcock gave an elaborate calculation of the working of the air engine, based on the specific heat of air and the use of the regenerator or economizer, concluding that the practical result attainable is a horse power per hour from .48 pounds of coal. He stated that the utmost capacity of the Cornish engine is 1.48 pounds of coal per horse power per hour; the common duty of the best, 1.98 pounds per horse power per hour; and the average duty, 2.64 pounds per horse power per hour; the best marine engines, 4.4 pounds per horse power per hour. A properly constructed air engine should, therefore, run for 25 per cent of the fuel used in the best Cornish engines or 11 per cent of that used in the best marine engines.

The remarks of Mr. Babcock led to a discussion, in which the value of the regenerator was brought in question, and statements were made in reference to the working of the Cornish, marine and other engines which varied somewhat from the figures given by Mr. Babcock.

The Cylinder Press.—Mr. Bruce, of Long Island, read a paper *apropos* of a recent statement in the New York *World*, to the effect that the invention of the cylinder press was made by Mr. Hoe, of this city. Mr. Bruce claims that he anticipated Mr. Hoe in his cracker machine, which was first made in 1826, and patented in 1832. In the cracker machine were similar combinations and motions to those in Hoe's presses; letter types and various devices were set on a cylinder by which the sheet of dough, as it passed through the machine, was printed.

Mr. Babcock—The first printing press made in America was a cylinder press. Mr. Hoe's patent claims only peculiar methods of holding the type.

Mr. Fisher—In 1832, in London, I saw types set on a cylinder for printing.

A Stranger—The first cylinder press was made in the last century. This machine printed both sides of the paper in one operation.

Mr. Bruce—I was aware of it; but I supposed, from the fact that it was not used that it was impracticable.

The Arts and Sciences at the West.—Lieut. Governor Noble, of Wisconsin, was invited by the chairman to address the meeting. Mr. Noble said:—I have come to the meeting out of sympathy for the purposes for which the society is established. The subjects which are discussed here are such as I take pleasure in studying. Wisconsin is so new a State that our material and business affairs require all our attention. At Madison (our capital), however, we have a historical society which has a collection of books and American relics of which we are proud, and meetings something like this have been projected. But it will be a long time before we can have the facilities of the citizens of New York, and we must still look to the east for light. Wisconsin is remarkable for her mineral wealth, and I should take pleasure in giving you an account of what we are doing with it, but I will not trust myself, without some preparation, to give you accurate statements, especially as I may have another opportunity.

On motion of Mr. Fisher, Mr. Noble was presented to the Standing Committee for honorary membership.

The regular subject—"Preservation of Wood Exposed to the Weather"—was here introduced.

DISCUSSION.

Mr. Bruce—This subject was recently discussed by the Farmers' Club, and it seemed to be concluded there that it was an excellent plan to preserve wood for fence posts by first immersing them in sulphuric acid.

Mr. Dibben—My experience opposes such a recommendation. I once had the fortune to occupy premises which had been vacated by a soda water manufacturer. Sulphuric acid had been plentifully spilled on the floor and sprinkled on the plastering. Wherever the acid touched the floor the wood was rotten, and where the acid had leaked through to the room below, the ceiling came down. Acid is sometimes used to stain wood, but it always impairs the strength.

Mr. Veeder—On the railroad between Pittsburgh and Cleveland is a coal oil factory, which produces an oil which has not been found fit for any of the ordinary uses of coal oil. It has a very pungent smell, and contains a very large per cent of creosote. From the locality of the works and the nature of the oil, I believe it may be found profitable to establish there a creosoting depot, provided there is so much virtue in creosote as is claimed. These oil works at present are able to turn out 200 gallons of oil per day, but the material is abundant enough to yield many times that quantity for a long time. This oil can now be bought for five cents per gallon. I have experimented much on wood for fence posts, and have adopted the plan of soaking them for a considerable time in water, and afterward well seasoning before use. It is well known that the lumber now received from the West is not so durable as that of fifteen or twenty years ago. This fact is accounted for from the methods of transportation; formerly the lumber was rafted on the rivers and canals to the city; now it comes in boats or by railroads.

Mr. Koch—The explanation of the effect of water is very simple. The harm to wood comes from the presence of sap, and by soaking the wood in water, the sap is dissolved out.

Mr. Seely—Mr. Koch's remark that the decay of wood is dependent on the presence of the sap is correct. The part of the wood which is useful (the woody fiber), is as unchangeable as wool or cotton; and, in fact, is chemically the same as cotton. If wood be fired from Lyman's steam gun, the fibers are detached from each other; and if they be washed, they can hardly be distinguished from cotton. The plans of preserving wood, therefore, imply treatment of the sap. The sap is a solution in water of matters similar in their nature to the white of an egg, and when the sap is spontaneously decomposed, it smells bad, and acts as a ferment on the woody fiber, precisely as the white of an egg will. Now, as suggested, the sap may be dissolved out; but this plan is not systematically carried out anywhere—it involves great difficulties. The plans most recommended are such as change the nature of the sap and leave it in the wood. They propose to coagulate the albuminous substances of the sap. For this purpose we have the choice among many substances. Ten or fifteen years ago, the methods known as "Kyanizing" and "Payenizing" were much approved, but they did not come into use by reason of the expense of chemicals and the difficulties in the way of getting them into the wood. But lately we have a cheap material, easy to work with, and more effective than anything else. I allude, of course, to creosote. The word means "preserver of flesh," and is suggestive of the fact that whatever will preserve meat will preserve wood also. There is no surer way of preserving meat than by smoking; and in this process it is the creosote alone which effects the object. Wood may be preserved by smoking, and the explanation is precisely the same as in the case of meat; the albuminous matter is coagulated. Creosoting is the process which must take the place of all others for preserving railroad timber and rude woodwork. The supply of creosote from coal tar and coal oil works is sufficient for all demand, and, in the state fit for use, will not cost more than eight or ten cents per gallon. The crude creosote is peculiarly fitted for use on wood from its very impurities. The oils from coal have the property of penetrating readily where water solutions go with difficulty, and the tarry matter dries into a varnish on the surface, which keeps out the air. Its use, too, is easy. The wood needs only to be well dried and soaked in the liquid.

W. H. Johnson—The Reading Railroad Company have for some time adopted the process of smoking their railroad ties. The wood is piled on trucks, and rolled into the smoking chamber. I have had considerable practical experience in creosoting timber. The wood is first thoroughly dried, and, while hot, is immersed in the tank of creosote. A soaking of eight or ten days is quite sufficient for railroad ties. I have abundance of certificates and recommendations of this process. In Europe, as well as here, it is considered to be the only practicable plan. The selling price of the crude creosote is ten cents per gallon; this article is the last portion of the distillation from coal tar.

Mr. Garbanati—The timber our forefathers used seems to have had less need of artificial means of preparation than the timber of our own times. Two or three hundred years ago they built houses which required to be pulled down when they were in the way. Now, with all our science and progress, our houses tumble down of their own accord. There is something to be studied about the time of cutting timber and seasoning it.

Mr. Hough—Nature has fixed the time of cutting in the winter season, when the sap is dried up and exhausted in the process of conversion into fiber.

Mr. Dibben—The ends of timber always give way soonest, a fact that may easily be verified by inspecting any old wooden bridge. The joints collect the water from the rains, and the fibrous wood sucks it in. Coagulating the albuminous matter is not sufficient; it does not make the wood impervious to moisture. Fence posts in sandy soils, now wet, now dry, never last long. A neighbor of mine, a few years ago, tarred some of his fence posts, leaving others in the ordinary condition, and he was soon so well satisfied with the effect that he has replaced all the unprotected and rotten posts with others thoroughly creosoted. Creosote is effective, but has a most villanous smell. If any one will deodorize it he will do us a great service.

Professor Hedrick—If you take away the odor, you have no creosote. The odor is its inherent property.

Mr. Seely—The crude creosote is not so offensive as gas tar. The sulphur compounds and most volatile products are got rid of in the distillations. To some people creosote is not at all offensive. It is only proposed to use it for outside and very coarse work.

The Chairman—How much creosote is needed per cubic foot of wood?

W. H. Johnson—About eight pounds.

Mr. Koch—A cubic foot of pine weighs thirty six pounds.

Mr. Garvey—The methods of preserving wood may be summed up as follows: 1st. Sealing up the pores by varnishes or paint. 2d. Disposing of the sap by soaking in water, heat, or chemical agents. 3d. Filling up the pores of the wood with some inorganic substance which will exclude the air and moisture.

Dr. Van der Weyde—Wood for pianos and some other musical instruments is seasoned by exposing it for six weeks, in a chamber heated to about 150°.

Lieut. Governor Noble—I have seen a method of thoroughly seasoning 1 and 2-inch boards in 24 hours—a cheap process, and objectionable only from danger of fire. A kiln is built with double walls, filled in with spent tan or saw dust, and in one corner is the furnace, with pipes traversing the space, so as to give considerable surface. Steam is let into this chamber, and you have the lumber surrounded with superheated steam and air at the ordinary pressure. This apparatus was found to be quite serviceable, so far as speedily seasoning the timber, but several of the kilns took fire when great precautions had been used to prevent such accidents.

Same subject to be continued next week.

GIVE THE PRICES.

MESSRS. EDITORS:—On page 245 of the present volume of the SCIENTIFIC AMERICAN, I see an engraving of a combination auger. Can you inform me if said auger will, under ordinary circumstances, perform all that is there claimed for it, and could you inform me of the price? The reason of this inquiry is, I have written to Mr. Hathaway, according to the directions in your paper, and have received no answer. I should like inventors generally to affix the price of their articles, as I think it would do them no material injury in the sale of their wares. An answer in your "Notes and Queries" will much oblige a subscriber. D. E. S.

Oswego City, November 3, 1860.

WATER GAS TROUBLES,—A quarrel has been in progress for some time past between Henry C. Carey, Marmaduke Moore and A. Hart, of the Water Gas Works, and Professor Cresson, Engineer of the Philadelphia Gas Works. The controversy has brought out a pamphlet of 67 pages on the part of the Water Gas folks, in which the Professor is handled in language not particularly complimentary. This is a personal matter, however, and we notice by the Philadelphia papers that it is to be ventilated through the courts. Make a legal ring, and let us see a fair fight and no foul play.

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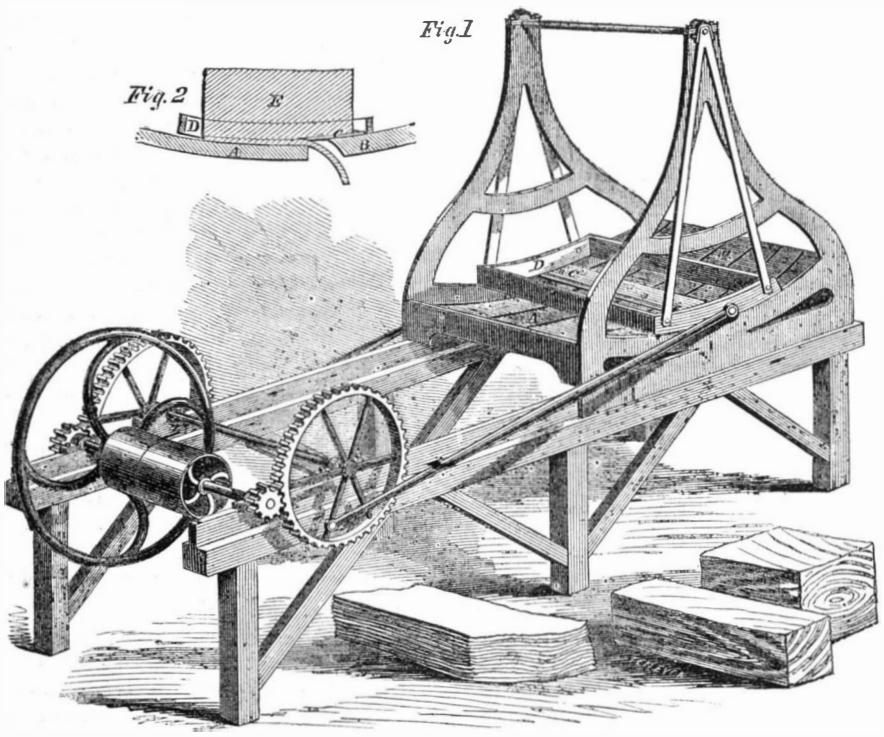
COOK'S IMPROVED VENEER AND THIN LUMBER CUTTER.

The machine here illustrated for cutting veneers and thin boards operates on the principle of a plane, the veneer being cut like a shaving from the bolt, by a thin steel edge. Its construction is clearly represented in the engraving.

Two stationary concave beds, A and B, Figs. 1 and 2, are firmly secured to a suitable frame, and to the edge of the upper bed, B, is fastened a sharp steel cutter, C. An open box, D, without top or bottom, is suspended concentrically with the curve of the beds, so as to swing just above them. Now, the bolt E, Fig. 2, to be cut into veneers, is placed loosely into the swing box, with its end towards the edge of the cutter, when, as the frame swings forward, a veneer is shaved off from the lower side of the bolt, as shown in Fig. 2. As the frame is drawn back by the machinery, the end of the block drops down in front of the knife ready for a second slice to be taken off, and thus the work proceeds till the whole bolt is cut.

The inventor states that he has one of these machines running, and that it operates in the most admirable manner, that it will cut, not only veneers from 1-25th of an inch in thickness upwards, but that it does good work in cutting thin boards for drawer bottoms, door panels, &c., up to a thickness of $\frac{1}{8}$ of an inch.

The patent for this invention was granted, through the Scientific American Patent Agency. Feb. 3, 1857, and an application is now pending before the Patent Office for an improvement on the inventor's first patented machine. For machines or patent rights, or other information in relation to the matter, inquiries may be addressed to the inventor, Peter Cook, at Tonawanda, N. Y.



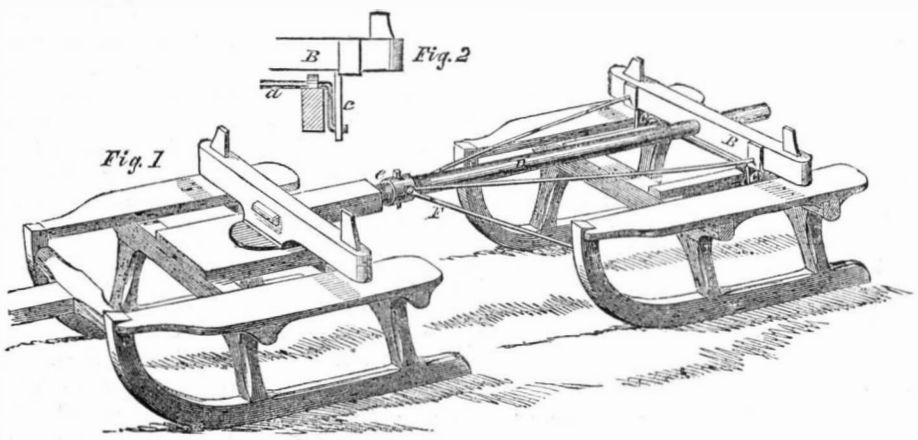
COOK'S IMPROVED VENEER CUTTER.

STONE-BREAKING MACHINES.—A correspondent of the London *Engineer* states that the most efficacious mode of breaking stones is a chemical process by which the stones are first heated and then split by the action of sulphur. We have a better system than this in New York. In the Central Park, there is machinery on the same principle of Battin's coal breaker, driven by a steam engine, which breaks stones into small pieces for macadamizing the roads of the park, and we are positive that the stones are thus broken, and passed through a screen to gage the different sizes, at a less cost than the expense of fire that would be required to heat the stones for their treatment with sulphur. The mechanical system has also the advantage over the chemical one by the certainty with which the stones are broken and separated into certain sizes for use. By the chemical process no uniformity of action can be attained. It is our opinion that one or more of such machines may be economically employed in constructing macadamized roads in any part of the world.

DISASTROUS BREAKDOWN.—The steamer *Connecticut*, of the Norwich line, on her last trip from this city, met with an accident to her engine which totally disabled her. The working beam broke just forward of the air pump center when the piston was near its upper center, leaving the piston free to jump out of the cylinder, which it did, carrying with it the cylinder head and bursting the cylinder itself in three places. The spring beam was demolished, and the piston rod, some seven inches in diameter, bent nearly at right angles. The wrought iron strap which surrounds the beam skeleton was the part which gave out first, being, at the point of rupture, $6\frac{3}{4}$ inches by 5 inches. The guides did not escape injury in the general havoc, the foot of one of them being broken off. The damage is extensive to the engine, involving the replacement of the following parts, all of them costly to manufacture: A new piston, cylinder, working beam, cylinder cover, and probably one guide and spring beam. The Morgan Iron Works, of this city, have the repairs in progress.

IMPROVED SLEIGH COUPLING.

It is well known that the bodies of long sleighs are apt, in passing over uneven ground or inequalities in the snow, to be twisted or wrenched, and thus rapidly destroyed. To avoid this destruction, R. Sutton, of East Avon, N. Y., has devised the coupling for sleigh runners illustrated in the annexed cuts, by which plan the runners are allowed to rock freely under the body, while the body maintains a comparatively level and even position; thus not only preserving the body from being strained and broken, but also securing greater ease and comfort to the occupants.



SUTTON'S IMPROVED SLEIGH COUPLING.

In this plan, a bolster is placed on each pair of runners, the forward bolster resting on a metallic plate, and being secured to the runners by a king bolt, in the ordinary manner. The other bolster is secured to the back runner in the manner clearly represented in Fig. 2. An iron rod, *a*, passes across the upper side of the runner, to which it is secured by loops, so that it may rock, and is bent down at each end, forming two cranks. To the lower side of the bolster *b*, are rigidly attached two pendents, through the lower end of which the cranks of the rod, *a*, pass, forming double and very easy joints. The reach, D, is made cylindrical in most of its length, and passes through the back bolster and through the metal ring, *e*. This ring is attached to the forward part of the back runner, by two rods, *f*, and is braced from the ends of the bolster, B, by two other rods, as shown. This mode of connecting the back runners with the reach is necessary in order to allow the rocking back and forth of the runners on the crank of the rod, *a*. A pin passes through the reach to prevent the ring from slipping too far back.

The patent for this invention was secured, through the Scientific American Patent Agency, on the 14th of June, 1859, and further information in relation to it may be obtained by addressing the inventor as above.

IRON VERSUS WOODEN WALLS.—The London *Times*, in an article upon the necessity of iron-cased ships for the British navy, thinks that it will be announced next Session that the navy must be reconstructed. "It has been proved," says our cotemporary, "that an iron-plated vessel, steaming 13 knots, is possible, and that such a vessel must destroy any number of *Marlboroughs* and *Royal Alberts*. The *Gloire*, built at Toulon, is the new wonder, and, unless we would see the ocean in the power of our rivals, we must begin at once to build *Gloires* in such numbers as to defy rivalry." But, although the necessity of this reconstructive process in the navy is thus announced by the leading organ of Great Britain, there are at present no less than 42 vessels of war, carrying from 1 to 91 guns, being built on the old principle. It is, however, stated that a large steel plated iron vessel, a rival for the *Gloire*, is about being laid down at Chatham, the dock in which this gigantic vessel is intended to be built being one of the largest at any of the royal establishments; but, notwithstanding its great size, means will have to be taken to increase its length before the new ship, which is to be upwards of 400 feet in length can be commenced. The whole of the ironwork required in the construction of the vessel will be prepared at Chatham dockyard, and, in order to meet the increased demand which will be made on the smiths' department, additional furnaces will be required to be erected contiguous to the dock, and a number of fresh hands taken on. As soon as the new vessel has been fairly commenced, the work is to proceed without intermission, the authorities being anxious that the first of the steelplated shot-proof vessels may be afloat early in the ensuing year.

APPLYING SULPHUR TO GRAPE VINES.—A series of experiments with the application of sulphur to grape vines to prevent the attacks of the vine parasite were made in France this year, by M. Mercieul, of La Tour, St. Gelen, who has sent an account of the results to the Academy of Sciences. He removed about a foot of soil round the stems of the same vines, but did not go any deeper than the filaments of the roots. A handful of sulphur was then sprinkled into this cavity, most of which was placed upon the stem. This was in the month of August last, and the vines so treated were made healthy, while those which were not so treated were much affected with the blight. Mr. Mercieul recommends winter as the best season for applying sulphur-

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Scientific American.

MUNN & COMPANY, Editors and Proprietors

PUBLISHED WEEKLY

At No. 37 Park-row (Park Building), New York.

O. D. MUNN, S. H. WALES, A. E. BEACH.

TERMS—Two Dollars per annum—One Dollar in advance, and the remainder in six months.

Single copies of the paper are on sale at the office of publication, and at all the periodical stores in the United States and Canada.

Sampson Low, Son & Co., the American Booksellers, No. 47 Ludgate Hill, London, England, are the British Agents to receive subscriptions for the SCIENTIFIC AMERICAN.

☞ See Prospectus on last page. No Traveling Agents employed.

VOL. III., No. 22....[NEW SERIES.]....*Sixteenth Year.*

NEW YORK, SATURDAY, NOVEMBER 24, 1860.

STEAM CARRIAGES FOR STREETS AND ROADS.

N the first page of our present volume, we presented an illustrated description of Rickett's steam carriage for common roads, which had been exhibited with so much *éclat* before the Queen of England and Prince Albert. Impressed with the idea of the practicability of this steam vehicle, the Earl of Caithness had one constructed for his personal use, after the same model, but with the addition of some minor improvements of his own. This carriage has operated so successfully that it has attracted a large share of public attention, and both the *Mechanics' Magazine* and *The Engineer* have given representations of it in their columns. On one occasion, it made a journey of one hundred and forty miles in two days, over mountain roads, and it ascended the Ord of Caithness, one of the steepest hills in Scotland, where the rise is one thousand feet in five miles and the road sometimes very abrupt in its turnings. All this was done with perfect safety, the Earl of Caithness steering the carriage, with his heroic lady by his side, and the engineer behind simply attending to the fire. The mountaineers were electrified with these performances; they gathered along the mountain paths and cheered the performance of the steam pony, which cantered up and down the declivities with foot as sure as that of their own sagacious Shetland nags. While stopping at the town of Wick, the honest burghers were so delighted with the steam achievements of the earl, that they made him a public banquet, and his good lady made a little speech on the occasion, in which she said: "I am sure that as long as Caithness can boast of a steam carriage for common roads, it may claim to itself what Americans would style 'a go-ahead country.'" That was spoken like a sensible, strong-minded woman, and we venture to assert, upon the strength of it, that this countess is a patron of inventors and a friend to mechanics.

This steam carriage weighs only two tuns; it is supported on two large side wheels, with a small pilot wheel in front—a three-wheeled carriage. It has two cylinders, each only six by seven inches; its power is nine horse, and it carries water and fuel for a twenty-mile journey. The seat resembles that of a gentleman's carriage and is placed in front, where it is steered, the drag put on when descending hills, and where the steam is also governed.

Of the perfectly practical character of this steam carriage there can be no doubt; and why should there be? Steam carriages on common roads were run at the rate of twelve miles an hour, thirty years ago; they were practical then, but not profitable as public conveyances. It is one thing for a gentleman of wealth to build a steam carriage for pleasure, as the Earl of Cathness has done, but quite a different thing to apply such a carriage for purposes of public traffic. The question is not the practicability but the payability of such agencies. It is not a question of profit and loss with a man of wealth who keeps his pleasure carriage—it is one of comfort and enjoyment—a constant expense, without an idea of profit. In this sense, we really hope that some of our men of wealth and fashion, who enjoy the exhilarating luxury of driving lightning-going steeds, will get one of these steam carriages and "clear the track" at the rate of twenty miles per hour. Such an establishment would undoubtedly create a sensation. We assure all who may wish to engage in such a laudable enterprise that such carriages can be built in any of our American locomotive shops.

A few years ago, the Hudson River Railroad Company employed a condensing locomotive, called the *Dummy*, for drawing the cars through the streets. It was laid aside after a time, but it is reported that the same company are now having two engines of a similar character built for them at Paterson, N. J. The reason for employing a condensing hauling engine in the streets is to obviate the noise of the exhaust in the chimney, which is said to be a terror to horse flesh. We are surprised at the thickheadedness of city authorities and others, in not permitting light high-pressure locomotives to run on street railroads. They are as safe and manageable as horses, and we doubt not but the time is not far distant when they will be allowed in all our streets, and when they will also be used for drawing heavy loads along the docks, in every notable shipping port in the civilized world.

THE PATENT OFFICE AND ITS ADMINISTRATION.

It has never been the policy or the purpose of the conductors of this journal to create a factious opposition to the management of the Patent Office. We have always endeavored to encourage the Commissioner in the discharge of his duty, and to render him, as far as we possibly could, our hearty co-operation. As evidence of this, we appeal to ex-Commissioners Mason, Holt and Bishop. It is true that when Judge Mason and Mr. Holt were at the head of the Office, we had occasion to differ with them, but our difference was amicably conducted, and at no time did we fail to receive from either of them, a frank and cordial welcome to the Patent Office. The affairs of the Patent Office are of deep public concern, and there is not a single section of our whole land which does not feel an interest in its perpetuity and success. We feel bound, therefore, from a sense of duty to the public, and especially to the great body of inventors, to exert our influence against any effort to drag the Patent Office back to the old illiberal basis upon which its affairs were conducted previously to the Commissionership of Judge Mason. Commissioner Ewbank was an honest man, and was faithful to the duties of his office; but he rendered himself unpopular, principally because—like most authors—he did not possess that administrative skill so essential to the proper management of so important a bureau, and failed to comprehend its true policy.

When Judge Mason took the office, he found its affairs not only in great disorder, but also in very bad odor with inventors and their agents. By a prodigious amount of labor and perseverance, he brought order out of confusion and soon established in the Office a sound and healthy policy. He relied on his own judgment in a great measure, and listened to the advice of subordinate officers and others only so far as he thought the best interests of the Office could thereby be promoted.

Judge Mason proved himself the inventor's friend, but, in reference to the examining corps of the Office, we feel bound to say that he sometimes allowed his sympathies to overbear his judgment. We remember, upon one occasion, asking Judge Mason why he kept a notoriously illiberal Examiner in office. He replied: "on account of his large family," at the same time admitting that the interests of the applicants under his charge were not properly conserved. We pressed the same inquiry upon Mr. Holt, and he acted upon it by removing the Examiner. He very justly remarked that "the Office might as well close its doors as to treat inventors thus."

In our article, two weeks since, we quoted from the admirable Report of Commissioner Holt, setting forth what should be the true policy of the Patent Office in its treatment of inventors. On the 13th of June, 1857, an application made by D. D. Badger, for an iron girder, was rejected, and upon it there arose a controversy. It was referred to one of the oldest Examiners in the Patent Office. He took the lantern of Diogenes, and searched in all the volumes, nooks and crannies of the Office, for the purpose of defeating the application. Commissioner Holt, in overruling the Examiner's decision in this case, uses the following language:—

"If, however, the stringent construction now favored in certain quarters be adopted in practice, it is to be feared that many inventors who have been summoned to this office by the Constitution, would find its doors shut in their face. It must be assumed, as the only tenable ground which can be occupied by the administration of this office, that every new and useful invention is patentable," &c.

The opposition which was arrayed against this genial and friendly policy (a policy well calculated to make the inventor feel at home under the roof of the Patent Office) amounted almost to insubordination; in fact, Commissioner Holt was obliged to remove some of the Examiners who undertook to subvert his policy. They found that the Commissioner was familiar with Dogberry's discovery, that when two persons undertake to ride the same horse, one of them must needs ride behind, and Mr. Holt probably thought that, under the circumstances, he was entitled to the front seat. The management of the Patent Office has been very successful for the past few years, and there has been but one opinion, outside of the Office, respecting its liberal policy. The recent inauguration, however, of the Revisory Board is a backward movement, and must result in great injury not only to the interests of the Patent Office, but also to the great body of inventors who are "summoned by the Constitution" to seek its protection. Inventors have a right to complain of this movement, and we are not surprised to hear, and to receive such comments upon it as it deserves. It is an unpopular movement and is exerting a pernicious influence upon the whole examining force of the Office.

There is another matter upon which we wish to say a few words. Commissioner Thomas has the reputation, we believe—and, no doubt, justly—of being an able lawyer. We have carefully examined some of his decisions on extension cases, and have usually found his opinions not only well founded, but ably sustained. But in looking over some of his decisions in interfering applications, we have found a singular incongruity between some of them and his decisions in extension cases. This discrepancy can be accounted for only by the fact that the Commissioner gives personal attention to the one, and refers the other to a special Examiner. In this matter, we are sorry to say the Commissioner seems not to be well sustained, and his administration is likely to suffer considerable reproach unless he applies a certain remedy which is within his reach. And here we would remark, that whatever opinion we might have entertained, heretofore, in regard to appealing from the decisions of the Commissioner to an outside tribunal, we have found by practical experience great benefit to some of our clients, from exercising this right of appeal. Take the case of Collins *vs.* White, for which a patent is now ordered to issue to Mr. Collins. An interference was declared between the parties, on an improvement in edge tools. Mr. Collins presented testimony taken in accordance with the established rules of the Office. Mr. White did not, but instead thereof, he made an *ex-parte* statement, giving no opportunity to Mr. Collins either to confront him or any witnesses he might have brought forward, by cross-examination. It is a fact, and stands upon the records of the Patent Office, that the mere assertions of White were treated as evidence, and the issue was, in a great degree, determined against Collins by them. We cannot follow this case through all its zigzag movements; suffice it to say that for eighteen months it was oscillating between the Patent Office and the appellate court, until at last, his Honor Judge Merrick settled the question in favor of Collins. It required all this time, besides a considerable expenditure of money (enough to discourage inventors of moderate means), to overcome the obstinacy of the Patent Office, on what seems to us the plainest principles of law and justice. Mr. Collins failed to obtain justice from the Patent Office, and, acting on the advice of his attorneys, he sought and obtained justice from an outside tribunal. Inventors must never yield their right of appeal until the affairs of the Patent Office be conducted upon sounder principles than these. This is not an isolated case; there are others to which we purpose to allude more definitely hereafter.

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THE ROMANCE OF MODERN SCIENCE.

The old alchemists wasted their lives in the pursuit of two unattainable objects—the philosopher's stone and the elixir of life; the former to turn all metals into gold, and the latter to bestow perpetual youth. It is now known that the turning of all metals into gold would have greatly diminished, instead of adding to the wealth of mankind; for if gold were made so abundant, it would no longer answer the purpose of money, and for use in the arts it is less valuable than iron. It may be that men will sometime be brought to the belief that unfading youth would be no blessing, but with our light, it would be received as the greatest boon which it is possible to imagine.

Modern science does not expend its efforts in the pursuit of these chimeras; but while it is familiar with marvels of which the ancient alchemists could form no conception, its own future is not wholly unadorned with the dreams of romance. Had some superior intelligence appeared to one of the long-bearded old Arabs, among his retorts and crucibles, and prophesied the achievements which the human race were destined to make within a few hundred years, how utterly incredible would have been the prophecy!

Looking down the future he would have said, "It shall be ascertained that Arabia, the Red Sea, and all the countries that you ever heard of are not at rest, but are constantly rushing away towards the east more swiftly than the flight of an arrow from a bow. The distance from us to the sun is such that a horse, running 20 miles an hour, without rest day or night, would require more than 500 years to make the journey, and yet this distance shall be measured with a rod and line. Though this fiery orb is as large as 1,400,000 globes the size of this earth, man shall measure its mighty span. He shall weigh its vast mass with a balance, and the sum of its tuns shall be told. Hidden from the eyes of all who have ever lived, deep sunk in the depths of space, he shall behold countless myriads of other suns, and shall approximately compute the inconceivable distances which separate them from us. Swarming in the dust beneath our feet, in the air we breathe, in the interior of our own bodies, in every stagnant pool, he shall discover multitudes of living beings, of strange and curious structure, whose numbers cast those of the visible inhabitants of the earth into insignificance. He shall put iron into a condition in which it shall become as incorruptible as gold, and thus shall your long sought philosopher's stone be discovered. The impalpable vapor which rises from water he shall harness to his chariot wheels; he shall make it dig his mines, grind his corn, saw his wood, weave his clothes, and drive his ponderous iron ships over the stormy sea to great continents now undiscovered. At his easy command, the rock shall leap from its firm bed and rush headlong through the air. He shall lay his hand upon the solid mountains and they shall yawn open to his passage; he shall be borne through them in ease and comfort with a velocity unattainable by the fleetest steed. The sunbeam shall become his most faithful limner, and the thunderbolt of heaven the obedient servant of his will; in silence it shall glide swiftly forth, bearing his messages of business, of pleasure, or of caprice, to the uttermost parts of the earth in the twinkling of an eye."

The modern student of science, to whom these incredible marvels are accomplished and familiar facts, seems less hopeful of the continued triumphs of human intelligence than were the ancient alchemists; but there are some ardent imaginations that love to sweep forward and revel in dreams of the future power of our race; though the wildest flights of the most fertile fancy are tame when compared with the accomplished achievements of the past. These minds conceive that man's power of transporting his body from one place to another has by no means reached its ultimate limit; that he will not only move more swiftly over the earth, but that he will sail through the air and sweep under the sea. In their view, as the coal fields fail, man will bore through the solid crust of the earth and warm great cities with its internal fires. The appliances of industry will continue to be multiplied till all are able to command leisure, and thus to secure mental cultivation. With the removal of ignorance and the temptations of poverty, degradation, vice and crime shall cease, and oppression and war shall be brought to an end; and intelligence, comfort, prosperity, virtue, peace and happiness shall be the common inheritance of all. Higher still! As the decay of old age is caused by the gradual accumulation of solid deposits in the system, and as there are known solvents of these deposits, some of the boldest imaginations behold the future filled with the brightest of all hopes—the promise of perpetual youth.

WATER GAS FACTS.

To the Public.—In maintaining a controversy concerning the merits of Sanders' "Water Gas," we have been controlled by commercial and economical considerations, rather than by a desire to propound scientific theories, or to debate conflicting claims of patents. We believe that we possess a process, the general adoption of which would improve the quality of the illuminating gas in common use, while reducing its cost to consumers.

We have always invited critical inspection of the practical operation of the "Water Gas," and have made repeated demonstrations of each and every stage of the process of manufacture. A disappointed reporter to the Scientific American, however, who had aroused the suspicions of our company and of the employés at the Girard House, supplied that journal with a long statement of matters and things he neither saw nor heard, together with his conclusions from such premises. Facts being stronger than words, however abusive the latter may be, we submit the following statement of a single day's operations of the present week at the Girard House, as a sufficient refutation of Mr. Seely's slippery narrative and false conclusion.

Girard House, Philadelphia,
November 12, 1860.

To Henry C. Carey, Esq., President of the Keystone Gas Company.

Sir:—As requested by you, I respectfully submit a statement of the consumption of materials and the results thereof of twelve hours' regular running of the gas machinery at this establishment.

Yesterday, November 11th, we began our daily manufacture of "water gas," by Sanders' process, at 12½ o'clock P.M., our station meter registering an aggregate of previous manufacture of 610,700 cubic feet; our charge was exhausted at 12½ o'clock A. M., this date, the meter registering 621,900 cubic feet—thus showing our production of gas within that time to have been 11,200 cubic feet; the average manufacture having been 933 feet per hour.

The consumption of rosin was 497 lbs,, equal to 44 4-10ths lbs. per thousand feet of gas. The charcoal consumed was three bushels. The fuel used was nine bushels of coke. The cost of purification did not exceed one cent per thousand feet. At no time was rosin supplied to any retort, except in conjunction with the vapor of water as required by Sanders' patented specifications.

The foregoing comprises all of the materials used, excepting cost of steam, which is inappreciable, being taken from the boilers of the hotel, but which may be calculated to not exceed 1c. per thousand.

Yours, respectfully,
James E. Place, C. E.

—

Henry C. Carey, Esq.,

Dear Sir:—The quality of the gas made and used in the Girard House, during the hours covered by Mr. Place's statement, was fully equal to any previously furnished to us from our private works, and superior in brilliancy to the gas supplied by the city.

Very respectfully, yours,
Presbury, Sykes & Co.

Girard House, Philadelphia, Nov. 12, 1860.

The prices of the above materials vary in some degree in different sections of the Union. At those at which they can be here supplied, viz.:—Rosin, $1 75 per barrel; coke, 5 cents per bushel; charcoal, 11 cents per bushel. The cost of the "water gas," as above made, would be 40 cents per thousand cubic feet, exclusive of labor, which may be estimated from 10 cents down to 3 cents per thousand, decreasing with the increase of quantity manufactured.

We have repeatedly offered to supply the City Works with gas at seventy-five cents per thousand feet, and under arrangements that would give to the City Treasury perfect security against loss, and to consumers an absolute certainty of being supplied with a light far more brilliant than that they now obtain. Why have the Gas Trustees refused to accept the offer?

Henry C. Carey,
Marmaduke Moore,
A. Hart,
Committee of the Keystone Gas Co.

Philadelphia, November 13, 1860.

The above card we find in the advertising columns of most of the Philadelphia daily papers.

The Keystone Company will no doubt be surprised to find their advertisement transferred to these columns without charge, reflecting as it does upon the integrity of the gentleman who was sent to Philadelphia to investigate the merits of the Sanders' water gas. The result of his investigation was published two weeks ago, and notwithstanding the assertions of Mr. Place, engineer of the works, as to the wonderful results he obtained in twelve hours' operation, we still think the conclusions to which our reporter arrived are quite as likely to be correct as the statements of Mr. Place. It must be remembered that Mr. Place is in the employ of the company to whom he makes his report; that his statement is not accompanied by any affidavit that such a result was obtained, nor is it supported by the evidence of any one not pecuniarily interested in the success of the enterprise. The public have learned to make some allowance for the assertions made in newspaper advertisements, emanating even from the most respectable firms, and, while we are not advised whether there is any water gas stock in the Philadelphia market, the thought suggested itself on reading the above card that possibly the present stockholders had got alarmed at the proposal of having their works put to a practical test by disinterested, capable experts, and before the public demanded it in too strong terms to be resisted, they would try to sell their stock. Before such an examination, they would see what virtue—à la Bonner—there might be in advertising their wares. This was no doubt a wise conclusion, one that would suggest itself to any body of equally shrewd business men; but it is not for us to discuss the motive which dictated the above card; it is simply facts we want and which the public demanded. When these can be so easily obtained, by the company simply permitting a disinterested, competent person to make a few of the most simple tests at their works, which can be done in two hours' time, so as not to incommode their regular operations, we must think that their advertisement above does not detail all the facts.

We close by again reminding the Keystone Gas Company that the public will not be satisfied with the simple assertion of any one of their employés until supported by that simple test we have pointed out, made by some disinterested expert, in the presence of one or more disinterested, respectable gentlemen. We shall be more happy to chronicle the successful result after such a test than to be obliged to confirm the suspicion of the public as to the practicability of the Sanders' water gas.

DEATH OF LORD DUNDONALD.

By recent news from Europe we learn that this nobleman died in London on the 30th ult., at the advanced age of 85 years. He was a very extraordinary man; his numerous daring exploits as a naval commander, and his many inventions in the useful arts won for him a distinguished reputation for heroic courage, skill and inventive genius. His father—Archibald Cochrane, ninth Earl of Dundonald—was a good chemist, and quite an inventor in his day. His name appears on the roll of the early patentees, who succeeded in obtaining burning fluids from the products of coal tar. But he was a far better spender than a maker of money, for he actually wasted a large fortune in scientific pursuits, and his son, the lately deceased earl, declared that "of our once extensive ancestral domain in Scotland, I never inherited a single foot." His father's genius, however, he doubtless did inherit; so that after having chosen the navy as a profession, he soon became the most renowned officer in the British service. Being promoted to the command of a small war sloop of 158 tuns, named the *Speedy*, he contrived to carry terror along the whole coast of France, as a most daring and crafty cruiser. With this craft and only 50 men, he attacked a Spanish frigate of 32 guns, and captured her in one hour and a half. He was afterwards promoted to the command of a frigate, with which he was engaged in several actions of the most desperate character, and always with success. In 1807, he became a Member of the British Parliament, and was a bitter opponent of the corrupt tory administration of that day, and for this Lords Castlereagh and Liverpool revenged themselves, in 1814, by a cabal that deprived him of his command in the navy, his seat in Parliament, and doomed him for one year to a prison. After this, he left England, became commander of the Chilian fleet when fighting for independence, in 1817, and subsequently (in 1827) he became Admiral of the Greek fleet, then fighting for liberty against the Turks. Byron immortalized him in his "Don Juan," and his fame resounded throughout the world for deeds of successful and unflinching courage. In 1830, he was rein-

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stated with honor in the British navy; the charges upon which he had been dismissed were found to have been false, and he was soon afterwards promoted to be Admiral of the West India fleet. In this service, his attention was directed to the peculiar pitch of the remarkable lake in the island of Trinidad, and his inventive mind soon made it subservient to useful purposes. He secured patents in 1852 for making tubes and manufacturing oil from this substance, and some very excellent lubricating unguents have been made from it in the vicinity of New York. He was also the inventor of a rotary steam engine, which was used for some time in one of the British frigates, and quite a number of improvements relating to ships-of-war. Of all his inventions, however, perhaps the best is his vertical tubular marine boiler, for which he obtained a patent in January, 1843. This boiler has two water chambers, one above the other, connected by a series of water tubes between which the heated products of combustion pass from the furnace. In this boiler, a constant circulation of the water is secured, and so far as we can judge, this is essentially the one which has been lately adopted, and is now held to be the best in the American navy. An illustration of this invention was published on page 200, Vol. II., of the Journal of the Franklin Institute for 1850; and as our motto is, "honor to whom honor is due," we state these facts for the honor of the deceased noble inventor, who is now beyond the reach of flattery or blame, and who, after a thousand hairbreadth escapes from death on sea and land, lived long beyond the common age of man.

WATER GAS-A SENSATION.

The engineer in charge of the water gas works at the Girard House has seen fit to publish a letter in our excellent cotemporary, the Philadelphia *Ledger*, in which he charges that Mr. Seely signalized his arrival in that city, to investigate the water gas operations, by asserting that he had come "to prepare a sensation article, and that his stay was marked, while in that city, by a long confidential interview with one of the officials of the city gas works." The engineer gives these as the reasons why he could not accord to Mr. Seely the privilege of manipulating the works. He thought also that Mr. Seely "might possibly—either ignorantly, if not wilfully— disarrange the apparatus." If Mr. Seely is such an extraordinary character as is here represented, and made the "sensation" assertion here imputed to him, it would show conclusively that he was wholly unfit, scientifically and morally, to undertake such an investigation. But Mr. Seely made no such announcement. It is wholly unlike him, and is utterly inconsistent with all the facts of the case. As to the fears of the engineer that Mr. Seely might ignorantly or otherwise disarrange the apparatus, those who know Mr. Seely as a practical chemist, and his high character for honor and integrity, need not be told of the perfect absurdity of the engineer's fears.

Mr. Seely did have an interview with one of the officials of the city gas works, *but not until he had exhausted all the privileges that were accorded to him by those in charge of the water gas works.* He purposely avoided all intercourse with any one who was even suspected of hostility to water gas, until he had concluded his investigations. When parties feel obliged to resort to such tricks as the above, in order to support their cause, it suggests the suspicion, at least, that they must have a bad job on hand.

A GREAT REFORM COMMENCED.—We are pleased to find that the practice of having the scholars learn all their lessons during school hours has been adopted in a portion of our public schools, and it will, doubtless, be extended to them all. We hope that this step is but the beginning of a great reform, and that the whole practice of stuffing the mind with a mass of undigested matter will be abandoned. An eager desire to make a great show for the time or for the money expended is the most pernicious vice of our educational system; it leads to a hasty slurring over of lessons half understood, and begets a habit of being satisfied with vague ideas which is very apt to continue through life. The most rapid mode of teaching is that which requires every lesson to be thoroughly mastered and comprehended before it is passed by. A scholar with this habit of study will soon overtake another who is far in advance with crude and superficial notions of his studies. If parents or teachers are very anxious that a child should learn rapidly, let them insist that the lessons shall be few and short; no more than the child can learn both thoroughly and easily.

PATENT AGENCY DEPARTMENT—EXTENSIVE ARRANGEMENT FOR 1861.

The editors and proprietors of this journal desire to return their warmest thanks for the unbounded confidence which has been bestowed upon them by the inventors of the United States. During the year, now near to its close, the business of their office has largely augmented, and they confidently look towards the opening of a new year for a large increase in the amount of their professional business.

They will continue, as heretofore, to procure patents in the United States, Great Britain, France, Belgium, Holland, Austria, Russia, Prussia, Spain, Sardinia, and other countries where patent laws exist. In connection with their home and foreign offices, they have also a branch office opposite the Patent Office in Washington, and which will continue, as heretofore, under the special charge of one of the firm, and is now reorganized on a still more efficient basis to attend to all matters of our clients where personal intercourse at the Patent Office is important. With the view of placing the Patent Office department of their office upon such a basis as to promote to the fullest extent the best interests of inventors and patentees, the proprietors, Messrs. MUNN & Co., will not only continue to prepare Specifications, Drawings, Caveats, Assignments, Licenses, &c.; attend Rejected Cases, Re-issues, Extensions, Interferences, Disclaimers, Appeals, &c., but will also advise with patentees and assignees upon all questions of infringement, even to the prosecution of suits in the United States courts. Their arrangements for this and every other branch of professional business are complete, and parties who wish to counsel with and employ them can rely upon their utmost fidelity, and also upon such charges as will enable all patentees to seek the protection of the law in defence of their just rights.

Inventors and patentees will promote their best interests pecuniarily and otherwise by availing themselves of the extended facilities of this agency, which is acknowledged to be the largest and most efficient in the world. The experience of Messrs. MUNN & Co. extends over the past sixteen years, during which time thousands of inventions have been patented through their agency.

ANECDOTES OF THE STEAM ENGINE.—In our next number we shall commence a series of articles on "The Early Inventors of the Steam Engine." These papers will be illustrated with handsome engravings of all the old steam devices and engines that have been invented from the days Hero, of Alexandria, who lived 300 years before the Christian era, down to original steam engines of the Marquis of Worcester and the immortal James Watt. The information will be selected from rare and authentic documents, and will contain curious and useful historical anecdotes and mechanical data, well calculated both to instruct and amuse the general reader.

MIRRORS FOR THE CAPITOL AT WASHINGTON.—Thirty beautiful mirrors and fifteen cornices have been prepared at the establishment of B. W. Merriam, No. 84 Chatham-street, this city. The largest mirror is eight feet eight inches in hight by sixty-eight inches in breadth. It is surmounted by a figure of Washington delivering his inaugural address. The other mirrors range from four feet eight inches to five feet eight inches in hight. The fitting, molding and gilding were all executed at the above establishment, and the whole style is rich and appropriate.

TO PAPER MANUFACTURERS.—Since the introduction of envelopes, the outside leaf of most letters and notes is useless and wasted. People generally, to avoid the appearance of meanness, use a whole sheet, when a half one would answer every purpose. What is wanted to remedy the evil is, that paper manufacturers should manufacture letter and note paper in substantial half sheets; also, a stamp might be put in the center of the sheet, at the top, instead of on the corner as is now done, so as to distinguish it from the whole sheets.

A FOAM BREAKER.

MESSRS. EDITORS:—On page 261 of the present volume of the SCIENTIFIC AMERICAN, I notice a description of a "foam collector" for a steam boiler, which has led me to send you an account of a simple foam breaker, used very successfully, where nearly the whole contents of the boiler (it being of a gummy nature) would otherwise have been converted into foam. It may be of use to some of your readers. It consisted of a division in the boiler a short distance above the liquid, nearly flat on top end, slightly inclined from level, with a large valve near the middle opening upward, and a hole toward the lower end of the plate dividing the boiler, into which a pipe was tightly inserted long enough to extend down through the boiling liquid nearly to the bottom of the vessel. The valve was loaded to perhaps one-eighth of a pound to the square inch, and was opened near one-eighth of an inch by the passage of the steam and foam. The globules of foam or froth being driven with considerable force against the valve and through the contracted aperture into the upper chamber of the boiler, were broken, and the liquid composing them, passing down through the pipe, returned to the boiler below. J. M. S

Chester, Pa., November 8, 1860.

THE HOOSAC TUNNEL.—A steam engine is being put up at the shaft for the purpose of more readily drawing to the surface the rock and water In five days, having stopped work in the shaft in order to put up the engine, the water has filled up the hole 100 feet deep. The experiments previous to the destruction of the new machines for drilling, by the burning of the Globe Locomotive Works, gave very encouraging indications of success It was found to be practicable to drill in the hardest granite at the rate of one inch per minute, which is considered equal to three inches per minute in the Hoosac rock, and more than ten times as rapid as hand drilling.

RAW mellow apple (says Hall's *Journal of Health*) is digested in an hour and a half; while boiled cabbage requires five hours. The most healthful dessert is a baked apple. If taken freely at breakfast, with coarse bread and butter, without meat or flesh, it has an admirable effect on the system, often removing constipation, correcting acidities, and cooling off febrile conditions better than medicine.

THE ELECTRIC TELEGRAPH IN INDIA.—The telegraph which crosses the Kistna river, in India, is a galvanized iron wire rope $1\frac{3}{4}$ inches in circumference. It is made of three strands of wire twisted together, each strand having seven wires. It is carried from rocks 400 feet high above the river, and is secured to large posts of teak wood. The distance between the two points of support is 6,000 feet; the cable curves down at the middle to 60 feet above the water. It has been in operation for about twelve months.

IN 1700, Yale library contained but 40 volumes; in 1766, 4,000; in 1835, 10,000; and in 1860, 38,000. Added to this last number, the Linonian Brothers' Law and Medical libraries in the same building make a total of 67,000 volumes, under the care of Yale College, while the number of unbound pamphlets is estimated at 7,000. The oldest printed book in the collection is a copy of the tracts of St. Augustine, printed in Zurich in 1467.

THE GREAT EASTERN.—The London *Engineer* states that the owners of the *Great Eastern* have received $70,000 from the New York consignees, though the accounts have not been closed to show the results of the trip to this country. It is however expected that the receipts from passengers and visitors will very nearly cover the expenses.

LAKE SUPERIOR MINES.—We learn by the *Miner*, that up to Oct. 18 last, 3,085 tuns of copper have been shipped this year from the Lake Superior region. This is more than was shipped last year. All the mines seem to be in a prosperous condition. All the companies are increasing the number of their stamps.

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EXTRAORDINARY PROGRESS OF AMERICAN INVENTIONS IN EUROPE.

Patents for the following inventions have recently been secured in England, through the Scientific American Patent Agency, further showing the great and daily increasing progress which American inventions are making in Europe:—

Molding Candles.—Patentees, Henry Ryder and Horatio Leonard, of New Bedford, Mass. This is an improvement in the apparatus for manufacturing candles, especially those made of paraffine or other substances liable to adhere to, and to be broken in the operation of drawing from the molds. It consists in the employment of a trough at the top of the molds, of sufficient strength to bear the strain requisite to draw all the candles from the set of molds at once, and in the adjustment of springs for closing the lower ends of the molds for forming the tips.

Folding Frames for Umbrellas, Tents, &c.—Patentee, L. K. Selden, of Haddam, Conn. This umbrella frame is made with joints in the ribs, the inner ends of the ribs being fastened to a ring which slides on the central stick, so that by drawing down this ring, the ribs fold inward upon each other, occupying but half the space in length of the ordinary umbrella. The central stick also has a joint in the middle, so that it may be folded. When extended, suitable braces, coming nearly in line with their joints, hold the frame in position. The same device is applicable to tents and awnings.

Printing Addresses on Newspapers.—Patentees, Robert W. and Daniel Davis, of Elmira, N. Y. This is one of the best of the numerous plans which have been devised for printing addresses on newspapers. Each address is cut on a small wooden block, and the blocks are fastened on belts which are slipped upon rollers, so that by the rotation of these rollers, the blocks are brought in succession above the paper to be printed. The patent also covers an invention of a very simple machine for punching or forming the letters in the wooden blocks.

Machinery for Cutting Dovetails.—Patentees, Thomas H. Burley, Charles H. Phelps and William J. Lowerra, all of New York City. This valuable invention was fully illustrated and described on page 193, Vol. II. (new series), of the SCIENTIFIC AMERICAN. The dovetail grooves are cut in the ends of the boards or planks by means of swiftly revolving cutters; the board being tipped at an angle, first in one direction and then in the opposite direction, to give the proper taper to the grooves.

Packing for Pistons.—Patentees, Charles Lowery, of Brooklyn, and Horace A. Miller, of New York City. This improvement relates to that class of piston packing known as "metallic ring packing." It consists in producing the expansion of the packing ring or rings to make it or them fit the cylinder in which the piston works, by means of two levers which are fitted to the central hub or boss of the piston head, and are made to act on a cut metal ring fitted to the interior of the packing ring or rings.

Ships' Stores.—Patentee, George A. New, of New York City. This is Slater's ship stove, described and illustrated on page 288, Vol. II. (new series), of the SCIENTIFIC AMERICAN. The stove is hung in gimbals, like a ship's compass, so as to keep its top level notwithstanding the rolling of the ship; and the invention relates to the mode of leading the pipes out of the joints or journals by which the stove is suspended.

Sun Shades or Roller Blinds.— Patentee, Valorus Drew, of New York City. This patent covers several improvements in the mode of hanging window curtains. 1st. For regulating the strain of the cord for rolling the blind up or down; the cord is passed round a groove made at one end of the roller, and it also passes through a ring below, the latter being drawn by another cord fixed at one end to the window frame and provided at the other end with a friction bar or ring, whereby it may be retained at any given point. 2d. To secure the roller in the window frame, one end is provided with a fixed spindle, as usual, and the other end with a movable spindle, which is placed in a recess made in the roller, so that it may be pushed in or out as may be required. 3d. The shade is attached to the roller by means of an elastic rod which is passed through a hem in one end of the blind, and fits snugly in a longitudinal groove made in the roller, in which it is held by staples, and also by being tied or secured at the middle. Messrs. Sullivan & Hyatt, 34 Beekman-street, this city, are the full assignees of the patent.

[To be continued.]

RECENT AMERICAN INVENTIONS.

The following inventions are among the most useful improvements lately patented:—

FIRE-ESCAPE.

Hugh Morohan, of Brooklyn, N. Y., is the patentee of an improved fire-escape, and his invention consists in arranging a sofa or other piece of furniture by means of suitable braces and sections, and by a chain or chain-work in its interior, in such a manner that the same can be fastened economically, and with little loss of time, to the sill of an ordinary window, so as to form the means to pass out of the window and down to the ground by the aid of the chain.

POWER LOOMS.

The object of this invention is to prevent, as far as practicable, the loss of time which occurs in the operation of power looms for weaving hair cloth, when the attendant, whose duty it is to "serve" the hair to the contrivance which places it in the shed, fails to serve it at the proper time, or in case of any failure of the operation of said contrivance. Hair cloth is commonly woven with five sheds, which are opened in regular succession, and in operating a loom of the usual construction, it is necessary, in case of any such failure as is above mentioned, when any one of the sheds is open, to wait till the same shed is again opened before attempting to serve, or the cloth will be made uneven; and thus the time occupied by the opening and closing of the whole number of sheds is lost. A stop motion has been used for the purpose of stopping the harness motion of the loom instantly when the hair is, from any cause, not placed in the shed that is opened to receive it; but this is liable to some serious objections. This invention consists in the use of automatic mechanism which so controls the operation of the harness motion that the opening of the same shed is repeated during the following movement of the lay whenever a shed fails to have the hair placed within it, and such repitition is continued with each beat of the lay until the shed receives the hair, when the operation of the harness proceeds as if no interruption had taken place. Isaac Angell, of Pawtucket, R. I., is the inventor.

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING NOVEMBER 13, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

. Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

30,608.—Elliet Andrus, of Geneva, N. Y., for an Improvement in Apparatus for Drawing Water from Wells:

I claim the arrangement and combination of the several parts, for the purpose and to accomplish the result, as above specified, of emptying a bucket.

30,609.—S. F. Atherton, of Fitchburg, Mass., for an Improvement in Hoop Machines:

I claim, first, The combination of a gage cutter with a cutter head, constructed substantially as described, and having continuous rests, a and b, for the support of the hoop upon each side of the finishing cutter, as set forth.

Second, I claim the crimping roll, L, for giving form to the hoop, as described.

30,610.—A. J. Bartlett of Romulus, N. Y., for an Improvement in Excavators:

I claim the arrangement and com ination of the hollow scoop or shovel, D, endless apron or elevator, I, and trough, N, when hinged or jointed together, so as to allow the required adjustments of the said scoop, and operating together substantially in the manner and for the purposes specified.

30,611.—R. C. Bristol, of Chicago, Ill., for an Improvement in Slide Valves:

I claim, first, In combination with a valve carried upon rolling supports the use of bearing pieces of metal above and below such supports capable of being detached from the valve and cylinder face, in order that such bearing pieces may be made of a more durable material or be taken out and replaced when worn or injured.

Second, In valves mounted as above described, the wedge form of the bearing piec s, E, in combination with the corresponding inclines, C', upon the valve or cylinder face, for the purpose of adjusting the valve to its seat, or to the diameter of the rolling supports, G, substantially as described.

30,612.—B. F. Chappell, of Norwich, Conn., for an Improved Plumb-bob:

I claim, as an improved article of manufacture, a plumb bob, provided with a train of wheels, spring and stop, and otherwise made as shown and described.

[This invention consists in introducing within a hollow plumb bob a flanged drum or reel around which the string by which the bob is suspended is wound by a spring and train of wheelwork, and it consists further in applying a pinch-screw to the top of the bob by which the string may be stopped when entirely or partially unwound from the drum, so that a short or long string may be used as occasion demands.]

30,613.—A. F. Cobb, of Chapel Hill, Mo., for an Improvement in Fire Alarms:

I claim the arrangement of a crank shaft, A, alarm bell, H', rattle, C D, lever, L', gun, O', and cord, J, in combination with independent crank shafts, L W, dogs, M Y, and cords, P T, leading to various parts of a building, substantially as and for the purpose set forth.

30,614.—L. A. Colbert, of Baltimore, Md., for an Improvement in Warming Apparatus:

I claim the adaptation and arrangement of a warm air reservoir or receiver, A', of box or niche form, and furnished with a door, B, a bottom passage, C, a side dampered passage, E, and a top dampered passage, F, all for use in combination with the ordinary furnace, hot air flue, draught or chimney flue, and flue leading into elevated chambers, substantially in the manner and for the purposes set forth.

30,615.—L. P. Collins, of Sacramento, Cal., for an Improvement in Loop Catches for Sewing Machines:

I claim a metallic or ether hard loop catcher for sewing machines composed of a hub or main nut, a, in Figs. 1 and 2, also an adjusting screw, e, also, check nut, f, also, rib or latch, 2, so that the catch being hard and unyielding, against which the loop comes in contact, can be so adjusted by the screw, e, and firmly held by means of check nut, f, that the finest thread cannot pass between said catch and the rotary hook until the proper time for its release, the whole being constructed, arranged, and operating as set forth and explained.

30,616.—G. D. Colton, of Galesburg, Ill., for an Improvement in Apparatus for Drawing Water from Wells:

I claim the employment of the shaft, D, the cylinder, E, the lever, F, the ratchet wheel, a, and ratchet, c, together with the stop, n, the several parts being constructed and arranged substantially as and for the purpose specified.

30,617.—J. W. Crawford, of Rockport, Ind., for an Improvement in Grafting Machines:

I claim, first, The knife, a, with its weight, C, and the device described for operating it, in combination with the slotted bed plate, E, stops, d d, and gage, y, as and for the purposes set forth.

Second, In connection with the above, and on the pedestal, A, the sliding knife, g, its frame, F, and slide rests, G G, with the adjustable inclined bed pieces, e e, arranged and operating as and for the purposes set forth.

[This invention consists in arranging on the top of a suitable standard a weighted cutter which works between two perpendicular guide ways operated by a foot bearer for splitting the stock; and it also consists in arranging by the side of this stock splitter a reciprocating knife and inclined adjustable bed pieces for preparing the wedge on the scion.]

30,618.—Perry Davis, of Providence, R. I., for an Improved Boat, Convertible into a Land Carriage:

I claim the combination of the clamps, C D, and rubber springs, e, formed as shown, with the axle, B, and boat, A, in the manner and for the purposes set forth and described.

I also claim the combination of the peculiarly formed rubber spring clip, G, and plates, g g', with the axle, H, hook, F, and bow of the boat, in the manner and for the purposes shown and described.

I also claim the arrangement of the wheels, B, with the clamps, C, as and for the purposes shown and described.

[This invention is an improvement in boats to be used on land and on the water, for pleasure purposes. The invention consists in mounting the boat at its bow on an india-rubber spring of peculiar construction when it is used on land, said spring being attached to a square axle or to a square enlargement of an axle, and connected to the bow of the boat in such a manner that the front wheels, or the axles of these wheels, will have a universal play, and so that the bow of the boat will not be subjected to any jar and concussion in passing over rough roads. It further consists in arranging in the stern of the boat, above the keel, two paddle wheels, and in using a center board or false keel arranged between the paddle wheels, which wheels have independent shafts, and are turned by pulleys, bands and cranks.]

30,619.—S. S. Day, of New York City, for an Improvement in Fly-traps:

I claim the use or employment of the shelf, F, in combination with the lever, H, catch, G, spring, I, and lifter, J, when the same shall be combined and operated in the precise manner specified or by means substantially the same or in an equivalent manner.

30,620.—John Dickinson, of Painesville, Ohio, for an Improved Last-holder. Ante-dated Aug. 14, 1860:

I claim the mode of securing immovable, or nearly so, the turntable in any position of its vertical axes, by means of the bolt, I, provided with reversed screws on its ends, and operating in combination with the tapering journals of the lower plate, Q, of said turntable, as described and for the purpose stated.

30,621.—H. Wm, Dopp, of Buffalo, N. Y., for an Improvement in Vapor Lamps:

I claim mingling the vapor formed with atmospheric air above the burner, as at a a, Figs. 1 and 8, the vapor and the air descending through the pipe, A, to be burned at the burner, B, as and for the purpose specified.

30,622.—D. F. Dunham, of Brook, Ind., for an Improvement in Spelling Boxes:

I claim the spelling box with wheels having letters printed on them, as set forth, constructed as described for the purposes set forth.

This invention consists in enclosing within a suitable box having a small opening in one side of its top two or more wheels or cylinders, each of which has an independent rotary movement to the other, and in covering the peripheries of said wheels with the vowels and consonants, making a perfect word, and arranging on the next wheel the alphabet of any language, so that by rotating one of the wheels the letters may be grooped together to form words or parts of words, or simple and compound words.]

30,623.—E. G. Dyer, of Hamilton, Ohio, for an Improved Feed Motion for Head Blocks of Sawmills:

In combination with the ratchet wheels, F F, by means of which the head blocks, B B, are operated, I claim the described arrangement of the palls, h h', vibrating pieces H H, connecting rod, I, hand lever, L, and pivoted bars J J, whereby the operator is enabled to move the log readily and with precision towards the saw, so as to produce either parallel or tapering cuts as the same as may be desired, in the manner as and for the purposes specified.

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30,624.—E. Ehlin, of Boston, Mass., for an Improvement in Fire Alarms:

I claim, first, The employment or use of a fuse, K, in connection with a weight sustaining combustible thread or fuse, u, applied to a lever and weight, E F, connected with an alarm, to operate substantially as and for the purpose set forth.

Second, In connection with the fuse, K, applied as shown and described, the perforated pipe, H, one or more, and water supply pipe, G, connected by a tube, m, provided with a cock which is connected to the lever, E, to operate as and for the purpose set forth.

[This invention consists in the employment or use of a fuse connected with an alarm, whereby the fuse, in case of the building taking fire, will conduct the flame to a thread or fuse which holds a weight connected with the alarm mechanism, and iguiting the weight sustaining the thread or fuse, will cause the weight to be liberated, the alarm mechanism to be actuated and the alarm sounded.]

30,625.—J. H. Elward, of Ottawa, Ill., for an Improvement in Mole Plows:

I claim the sectional mole, e d c, the coulters, a and b, the coulter, a, being movable with their respective loops and joints, in combination with the side draught of the plow from the link or loop at f on the side of the beam, A, through one of the slots in the transverse piece, for the purpose of giving any desired curvilinear direction to the ditch or drain, when the several parts are arranged and operated together as represented, and substantially as described.

30,626.—Robert Gamble, Jr., of Tallahassee, Fla., for an Improvement in Channel Excavators:

I claim the employment or use of a float, A, provided with an adjustable plate or platform, C, and side pieces, F F, substantially as and for the purpose set forth.

[This invention is designed to deepen or excavate the channels of running streams or tide-ways by deflecting the running water against the bottom of the same.]

30,627.—J. B. Gibbs, of Boston, Mass., for an Improved Skate Shoe and Foot Check:

I claim the grooved skate shoe, constructed substantially as described for the purpose specified.

30,628.—L. W. Harwood, of Troy, N. Y., for an Improvement in Stove Grates:

I claim, first, So forming and arranging an arm, D, fast on the grate, A, and in line, or nearly in line, with the rocking support, B, of the grate, substantially as described, that the grate may be both vibrated horizontally on its central pivot, C, and tilted into a vertical position upon its rocking support. B, by the use of the arm, D, alone, substantially as represented.

Second, I also claim the combination and arrangement of a perforated sliding plate, M, with the slotted casing, G, of the stove or furnace, the arm, D, and grate, A, pivot, C, and rocking bar, B, substantially as and for the purpose described.

30,629.—J. M. Heard, of Prairie Station, Miss., for an Improvement in Railroad Joints:

I claim the arrangement of the tongue, F, to pass into a cavity in the bar, D, so as to be supported thereby, as shown and described, when said tongue is made in one piece with the bar, E, and when the rails are notched and slotted and all the parts constructed and combined all as set forth and represented.

[The object of this invention is to connect together the ends of sections of railroad rails in a more simple and perfect manner than has heretofore been done, to provide for the expansion and contraction of the rail in consequence of the change of temperature, to provide against the jarring, and consequently the wearing loose, and springing of the rails at the joints occasioned by the concussion of the passing and repassing of trains over the rails, and to provide against the lateral thrust of the rails at the joints.]

30,630.—De Witt C. Hitchcock, E. B. Larchar and E. M. Larchar, of New York City, for an Improvement in Relief Printing Plates, &c.:

We claim the method of producing printing plates, blocks, &c., in relief, by employing liquid silex, or other material that has a hardening effect upon chalk, clay, or other analagous substance, or that has an affinity for, or the capacity to affiliate with the silex as a marking material, medium or ink, to delineate lines, figures, or any desired device, upon the surface of said chalk, clay, or other material susceptible of thus becoming hardened or petrified, and then removing the intervening and unacted on soft material next the surface, by brushing or rubbing so as to leave the said lines in relief, and finally solidifying, in a greater degree, hardening and petrifying the whole body, substantially in the manner and for the purpose set forth.

30,631.—David Johnston, of Eddyville, Iowa, for an Improvement in Water Elevators and Carriers:

I claim the arrangement of the track, carriage, hollow pin, bucket, knot, rope, pulley, A, and latches, B and D, when the whole is constructed, arranged and operated in the manner and for the purpose set forth.

30,632.—J. P. Kirk, of Austin, Texas, for an Improved Chain Link:

I claim the two pivoted hooks, A A', constructed and put together in such a manner that the ends of one hook will abut against or lap on the ends of the other hook, substantially as and for the purposes set forth.

[This invention consists in pivoting together, in a suitable manner, two hooks with beveled ends on the curved portions and straight ends on the shank portions, or in such a manner that, when a tension is brought upon the hooks, drawing from their center or axis of motion, their shank ends will abut against the hooked ends of each other, or lap and abut, and form a figure 8 connecting link, whose axis is to one side of a central line drawn diametrically through the two hooks.]

30,633.—E. B. Larchar, of New York City, for an Improvement in Fire-escapes:

I claim, first, Elevating a platform, or other equivalent device, by means of a telescope columu, substantially as and for the purposes set forth.

Second, I also claim the piston joint composed of the fast and loose collars and elastic packing, as described.

30,634.—Rufus Leavitt, of Melrose, Mass., for an Improvement in Sewing Machines:

I claim, in a sewing mechanism, the arrangement and combination of the spool, h, with the lever, C, or other moving part of the mechanism, whose movement is uniform with and relative to that of the needle and with the screw, K, or other equivalent means of adjustment, and spring, n, all operating together in relation to the movement of the needle, substantially as and for the purpose specified.

Also, the employment of the "take-up," for the specified purpose, in combination with a spring and cam, both arranged and operating together to give the take-up the movement due to the form of the cam except when, from strain upon the thread, it requisite for the take-up to yield to avoid breakage of the thread, which yielding the spring, as applied, permits.

30,635.—Meier Rosenberg and Henri Scheuerle, of New York City, for an Improved Spring Bed Bottom:

We claim the arrangement and combination of hinges with a bed bottom supported by springs, in the manner and for the purpose substantially as described.

30,636.—Nathan Maxson, of Wilmington, Ohio, for an Improvement in Harvesters:

I claim the arrangement of the automatic intermittently rotating platforms, V, between the finger bar, R, and dividing axle, C, as shown, so that the cut grain will fall over the fingers upon the said rotary platform and be discharged, as set forth.

[This invention relates to a novel arrangement of parts, whereby it is believed many advantages are obtained over the ordinary harvesters in use.]

30,637.—T. J. Mayall, of Roxbury, Mass., for an Improvement in Machinery for Making India-rubber Hose:

I claim the use of a series of rollers having carved peripheries, which bear upon and work the coating or covering of india-rubber or gutta-percha into the surface of the woven tube placed upon a suitable mandrel, substantially as described.

30,638.—Wm. McAllister, of Gerry, N. Y., for an Improved Manufacture of Cheese:

I claim, first, The use of sour whey in combination with rennet, as and for the purpose set forth; and in connection therewith, I claim,

Second, The use of brine in the manner and at the period in the process of making cheese, for the purposes set forth.

30,639.—Hugh Morohan, of Brooklyn, N. Y., for an Improvement in Fire-escapes:

I claim the arrangement and combination, as shown and described, of the brakes, J K, gears, L M, shaft, E, drums, F I, chain, G, and rod, d, as and for the purpose shown and described.

30,640.—L. W. Nicholls, of North Brookfield, N. Y., for an Improvement in Odometers:

I claim the arrangement of the tubular sleeve, J, in combination with the shaft, I, carrying the ratchet wheel, H, and with the shaft, K, giving motion to the registering wheels, substantially as and for the purpose specified.

[This invention consists in the arrangement of a square tubular socket or sleeve, in combination with the vertical arbor which serves to communicate motion to the registering wheels, in such a manner that said arbor is allowed to rise and fall with the motions of the carriage, and that sudden jerks or other violent motions have no injurious influence on the correct action of the register.]

30,641.—R. S. Payne, of Chicago, Ill., for an Improvement in Sewing Machines:

I claim a reciprocating disk and two loose feed rings, arranged upon the circumference of said disk and operated by mechanism, substantially as described, in combination with a needle working between the two feed rings, substantially as and for the purposes set forth.

30,642.—C. W. Pearson, of Charlestown, Mass., for an Improvement in Swifts:

I claim the combination of the hollow arms, C C' E E, and spring wires, G, for extending the same, substantially in the manner and for the purpose specified.

Second, I claim, in combination with the above, the hubs, B and D, and thumbscrew, F, for holding the arms in any required position, substantially as described.

30,643.—Julius Pollock, of Morrisania, N. Y., for an Improvement in Ventilating Sweat Leathers for Hats:

I claim making single sweat leathers for hats, with embossed protuberances at any desired distance apart filled in on the side next the hat with some light and elastic substance, substantially as described, to form yielding cushions against the forehead, as set forth.

And I also claim making such single embossed sweat leathers with crimped or embossed corrugations at the sides, when the same are stiffened by coating the inside next the hat with shellac or other waterproof cement, substantially as described.

30,644.—Servetus Longley, of Cincinnati, Ohio, for an Improvement in Street-sweeping Machines:

I claim the eccentric ring, H, arranged and combined with the brush heads, substantially in the manner and for the purposes set forth.

[This invention is applied to brooms or scrapers which extend diagonally across the machine, and which sweep or scrape, as the case may be, the dirt, dust and snow to one side of the machine into wind rows. It consists in hanging the broom shaft in such a manner that it may be raised or depressed, so that the brooms or scrapers may be raised entirely free from the ground if desirable; and it consists in attaching, by a crank arm, each broom or scraper head to an eccentric ring, which will keep the broom or scraper always in a perpendicular position with the surface of the street, at the same time all the brooms are allowed to yield and to accommodate themselves to the unevenness of the surface of the street.]

30,645.—G. S. Roundebush, of Natchez, Miss., for an Improvement in Cotton and Corn Stalk Cutters:

I claim the bi-conical roller, D, provided with the knives, E, in connection with the knife cylinder, H, and with or without the bars or scrapers, G, all being placed in the frame, A, essentially as and for the purposes set forth.

[This invention is designed for cutting into pieces standing cotton and corn stalks, so that the same may be plowed under the surface of the ground, and the latter rendered suitable for cultivation at a very moderate expense, the hitherto tedious hand labor being avoided and the work done much more thoroughly.]

30,646.—George Rugg, of Potsdam, N. Y., for an Improvement in Turning Machines:

I claim a new mode of constructing, arranging and operating devices, for the purpose as specified.

I claim, first, The tube stock, F, as attached and operated by means of the arm, d, the revolving pattern, L, and clutch, J, as connected and operated in the manner and for the purpose specified.

Second, I claim the guard, c c, as adjusted, for the purpose specified.

30,647.—Christian Sharps, of Philadelphia, Pa., for an Improvement in Forming Cartridge Cases:

I claim forming cases for metallic cartridges by placing a hollow cylinder in chambers of the desired form, and expanding the said cylinders within the chambers by means of plungers, through the medium of water or other suitable fluid, substantially as set forth.

30,648.—D. E. Somes, of Biddeford, Maine, for an Improved Heel Shave:

I claim the described heel shave, constructed substantially in the manner set forth, being provided with guides, a a, gage, E, adjusting screws, C C, set screws, D D, and double-edged knife, B, arranged as and for the purpose as described.

30,649.—Gustav Wedekind, of Philadelphia, Pa., for an Improvement in the Preparation of Transparent Pictures:

I claim affixing and preserving lithographic pictures upon glass, mica, or other similar transparent substances, to be used for gas or lamp shades, screens, &c., by means of a mastic composition and a solution of silicate of soda or potassa prepared and used as set forth and described.

30,650.—T. J. Weeks, of New London, Conn., for an Improved Harness Saddle:

I claim the disk, E, and bars, D D A B, constructed, combined and arranged substantially as and for the purpose set forth.

[The object of this invention is to obtain a harness saddle that will conform to the movements of the animal, without galling or injuring the same by rubbing and friction, even when made to sustain a heavy load.]

30,651.—S. W. Tyler, of Greenwich, N. Y., for an Improvement in Harvesters:

I claim, first, The combination of the automatically adjustable head piece, G, and twin plate, M, or their equivalent, with the cutting apparatus arranged and operating substantially as described.

Second, I claim the iron hanger, D, for a common support for the journals of the pinion and pitman shafts of a harvesting machine, when used as a strong iron brac of a light wooden frame, in combination with such frame, substantially as described.

Third, I claim the hand lever, L, when constructed and used as specified, in combination with the cutting apparatus, for the purpose set forth and substantially as described.

Fourth, I claim the adjusting rod, l, or its equivalent, by the use of which the driver, while on his seat, may bring the cutting apparatus to a position at right angles to the head piece, where it may be held in combination with the head piece and cutting apparatus, for the purposes set forth and substantially as described.

30,652.—Isaac Angell, of Pawtucket, R. I., assignor to the Pawtucket Hair Cloth Company, for an Improvement in Looms for Weaving Hair Cloth:

I claim the re-opening of the shed after the failure of the hook to take a hair, without stopping or disconnecting the heddles from their source of motion, in the manner, substantially as shown and described.

30,653.—H. N. Black (assignor to himself, H. Korn, Jr., and E. S. Bodine), of Philadelphia, Pa., for an Improvement in Machines for Hulling and Cleaning Rice:

I claim, first, The huller made up of plates of metal or other suitable material, the plates being detachable and having an elastic bed as the exterior hulling surface, and the solid cone for the inner hulling surface, as set forth.

Second, I claim the combination of a rubber constructed and operated as described, with the cylinder for chafing the grain, as set forth.

Third, I claim the brushes or polishers constructed and operated as described, in combination with a cylinder of solid surface for polishing the grain, as set forth.

30,654.—Jacob Kinzer (assignor to C. Adams), of Pittsburg, Pa., for an Improvement in Door Locks:

I claim combining the roller, E, with the latch bolt, B, for the purpose of lessening the friction when forcing the bolt back into the lock, substantially as shown and described.

30,655.—Frederick Landon (assignor to B. E. Huntley, J. M. Bowman, Charles Silliman and Lafayette Silliman), of Brockport, N. Y., for an Improvement in Harvesters:

I claim, first, The traction yoke or lever, D, the rods, L, the pinion shaft and the gudgeon, I, as fixed fulcra of the traction lever, in combination with the axle of the drive wheel, to secure a rolling or traction draught of the drive wheel while making descents, and especially when it may be necessary, in the use of the machine, to pass from declivities of greater or less degrees, for the purpose specified.

Second, The traction lever, D, the rods, L, the pinion shaft and gudgeon, as fixed fulcra for the traction lever and the axle of the drive wheel, in combination with the frame and finger bar, to secure an automatic adjustment of the finger bar to the periphery of the drive wheel, for the purpose specified, substantially as described.

Third, The combination of the traction lever, D, the rod, r, and the frame, A, to secure an adjustment of the finger beam with respect to the periphery of the driving wheel when the machine is used for harvesting grain, substantially as described.

30,656.—John McCarty (assignor to Leysert, McManus & Co.), of Philadelphia, Pa., for an Improved Horse Shoe Machine:

I claim, first, The combination of the stripper, P, weighted lever, L, and carriage, E, the latter having a plane parallel with that in which it moves, for receiving the weighted end of the lever, and the said plane terminating in an inclination, h, so that the said stripper may have the desired dwell between its upward and downward movements, as and for the purpose specified.

Second, The combination of the stripper, P, lever, L, and rods, Q and Q', or their equivalents, arranged and operating substantially as set forth, for the purpose set forth.

Third, The combination of the stripper, P, the former, K, and the projection, d, of the platform, B, the said projection being of the same form as, but somewhat less than the end of the former, K, and arranged to coincide with the latter during the operation of the stripper, as set forth.

30,657.—H. F. Phillips (assignor to Downs & Co.), of Seneca Falls, N. Y., for an Improvement in Apparatuses for Drawing Water from Wells:

I claim the combination and arrangement of the pivoted movable frame A, or its equivalent, for sustaining the shaft, f, and main pulley, G, with the stationary pulley, j, weight, K, and bucket, D, and catch lever, L, substantially as and for the purposes set forth.

30,658.—D. E. Somes (assignor to J. S. Anderson), of Biddeford, Maine, for an Improvement in Curing Provisions:

I claim salting and curing food and hides, in latitudes too warm for the ordinary processes to be carried on, by means of operating in excavations made in the earth, to a depth sufficient to attain the minimum temperature, and further cooled by artificial refrigeration as set forth.

30,659.—Owen Sturdevant (assignor to himself and J. S. Gregory), of Maquon, Ill., for an Improvement in Mole Plows:

I claim forming a circular hole or suitable space under the end of colter, E, in combination with a groove in the top surface of the mole tooth, a, and the closing portion, a', placed behind the mole tooth substantially as described, and for the purposes set forth.

[This invention is an improvement in that class of plows which make a small hollow drain, from 12 to 18 inches below the surface, by forcing a peculiarly pointed tooth horizontally through the ground. It consists in a novel method of closing up the opening in crown of the channel which is made by the colter, thereby preventing too much surface water from being drained off by the channels, and also preventing the channel from clogging up.]

30,660.—George Williamson (assignor to L. S. Goble and H. E. Richards), of Newark, N. J., for an Improved Clamp for Holding Cylinders to be Polished:

I claim the combination of the section, B, flange, K, spring, s, screw, c, and band, d, substantially in the manner and for the purpose described.

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RE-ISSUES.

F. H. Bartholomew, of New York City, for an Improved Method of Governing the Action of Valve Cocks. Patented June 20, 1854:

I claim, first, The combination of these three elements or devices, viz: 1st. a variable chamber provided with proper apertures for admission and discharge of fluid; 2d. two valves acting to open and close a passage through which water may flow, the one being on its seat or closing the passage, when the variable chamber is of largest capacity, and the other being in a like position or performing the same office when the capacity of the chamber is smallest; and, 3d. A proper connection between the valves and the variable chamber, so applied that the motions of the former shall be controlled by the latter, the whole three being constructed and acting in combination substantially in the manner and for the purposes described, when operated upon by any competent force.

Second, I claim the combination of two valves, a variable chamber and a connection between them all, substantially such as last enumerated, with a seat or platform, substantially such as is described, by means of a connection, substantially such as set forth, whereby the seat or platform, the valves and the variable chamber, all act in unison, substantially as set forth.

Third, As a means of preventing concussions on pipes supplying urinals or hopper closets where the amount of water used is not a material consideration, and where yielding seats or platforms are employed to open a supply valve, I claim the combination, substantially as described, of a variable chamber, a single valve and a yielding seat or platform, with proper connections and attachments, so that the motions of the valve may be caused by the seat and governed by the variable chamber, substantially as described.

Fourth, I claim the combination of a diaphragm performing the duty of a stuffing box, with a valve or valves and with a variable chamber controlling the valve or valves, the whole constructed and operating substantially as recited,

F. H. Bartholomew, of New York City, for an Improved Method of Governing the Action of Valve Cocks. Patented June 20, 1854:

I claim as my own invention the following devices in combination, viz: First, A pan provided with a proper rockshaft arm, or its equivalent.

Second, A valve or cock to open and close a passage way leading from a street main or its equivalent, to a basin of a pan closet.

Third, A variable chamber connected with the valve, so as to control its motions in either or both directions by retarding either its opening or closing, or both.

Fourth, A spring, or its equivalent, compressed when the valve is opened and expanding to close the valve when the pressure upon the spring is released.

Fifth, A lever so connected to the pan and to the valve as to open both when force is applied to the lever; and,

Sixth, A counter balance, or its equivalent, acting to raise or shut the pan, but not operating to close the valve; intending to claim none of these parts separately, but in combination only, and where all of them are constructed and operate in combination substantially as described.

R. M. Berry, of New York City, for an Improvement in Sewing Machines. Patented Dec. 7, 1858:

I claim forming the moving feeding surface of the material cork, or its equivalent, for the purpose and in the manner substantially as described.

Bernard Hufnagel, of New York City, for an Improvement in Photographic Baths. Patented Oct. 5, 1858:

I claim, first, The construction of a silver bath for photographic and ambrotype purposes, made out of two plates of glass with indiarubber packing between, and fastened together between wooden or other framework, in the manner and for the purpose substantially as specified.

Second, I claim the construction of the outer or wooden box or case and the manner of fastening the same together by screws, S, for the purpose and in the manner as set forth.

Third, I claim the arrangement of doors or panels, D D', in the front and back sides, B and B', or the outer box or casing, for the purpose substantially as described.

William Scarlett, of Aurora, Ill., for an Improvement in Skates. Patented May 29, 1860:

I claim, first, A skate composed of two sheet metal parts, A a A a, cut and bent into the proper form and applied together as shown.

Second, The employment of the central stiffening bar, D, in skates of the character above described, for the purpose set forth.

S. W. Tyler, of Greenwich, N. Y., for an Improvement in Harvesters. Patented Jan. 26, 1858:

I claim the single head piece, a, or its equivalent, as an intermediate automatically adjusting attachment for the reciprocating cutting apparatus to the carriages of harvesting machines, when combined with two or more main driving or bearing wheels and with the actuating gear in such a manner as to permit of the cutting apparatus being attached at the side of the carriage of the machine, and allow it to adjust itself to the inequalities of the ground, independently of the actuating gear and other main portions of the machine, for the purposes and in the manner substantially as described.

C. E. Smith and G. I. Hardeman, administrators of J. L. Hardeman (assignor to Wm. N. Whiteley, Jr.), of Springfield, Ohio, for an Improvement in Hemp Cutters. Patented August 21, 1855:

I claim, first, In combination with a cutting apparatus extending out from the side of the main frame at about right angles to the path of motion of the machine, substantially as described, I claim the employment of the horizontal reel, supported entirely outside of or near the stubble end of the cutting apparatus, and so constructed with curved beaters or arms, or their equivalents, that it will press or hold the standing grain against the cutting apparatus, and then sweep the falling and cut material off to the rear of the cutting apparatus and discharge it sufficiently to one side of the machine to admit of the latter passing between the thus discharged material and the standing material to make the next cut, substantially as described.

Second, I claim, in combination with the cutting apparatus and reel, the employment of the curved guide rod, n, arranged and operating as specified, for the purpose set forth.

Third, I claim, in combination with the cutting apparatus and the horizontal reel, combined and operating as described, making the end of the curved reel arms to pass around in the open space formed by the divider, as described, for the purposes set forth.

Charles Eddy and Jacob Shavor, of Troy, N. Y., assignees through mesne assignments of Henry Stanley, of Poultney, Vt., for an Improvement in Coal Stoves. Patented Jan. 4, 1845; extended for seven years from and after Jan. 4, 1859; re-issued April 10, 1860; and again re-issued May 8, 1860:

We claim the manner in which he arranged and combined as a whole the exterior parts, consisting of a projecting plinth or base, radiating columns, cornice or abacus, E, cornice, O, and of two cylinders. The first, a fire cylinder, A, having four triangular radiating flues or columns arranged, connected and combined with the same, one at each corner of the said projecting plinth or base, each forming a communication with the air chamber, a, in said plinth or base, and with the said intermediate chambers, E and E', in the said cornice or abacus; the second, a surmounting cylinder, A', having four triangular radiating flues or columns arranged, connected and combined with the same, one at each corner of the said cornice or abacus, E, having also the chamber, H, and having the cornice, G, upon the flat top thereof, substantially as described and set forth.

We also claim the arrangement and combination of the said shell, x, at or near and with the lower end of the said fire cylinder, A, and with the fire grate, d, substantially as described and set forth.

We also claim the arrangement and combination of the conical ring, i, having therein the grate, k, with the intermediate chamber, E, substantially as described and set forth.

We also claim the arrangement and combination of the conical ring, I, and the solid part thereof, with the rear intermediate chamber, E', substantially as described and set forth.

We also claim the arrangement and combination of the upper cylinder, A', and the flues or columns, B', and the chamber, H, connected therewith, with the cornice or abacus, E, or its equivalent, as and for the purposes described and set forth.

We also claim the arrangement and combination of chamber, H, having therein the damper, O, and thereto attached the exit pipe, F, with the rear intermediate chamber, E', substantially as and for the purpose described and set forth.

We also claim the arrangement and combination of the said shell, x, with the opening, S, or its equivalent, to diffuse and heat the air preparatory to its entrance under and into the fire, to aid, facilitate and promote the combustion of the fuel and to increase the volume or quantity of heat by means thereof, as described and set forth.

We also claim the arrangement and combination of the cornice, G, with the flues of columns, B', and with the cylinder, A', substantially as described and set forth.

DESIGNS.

N. S. Vedder (assignor to Hicks, Wolfe & Co.), of Troy, N. Y., for a Design for Parlor Cooking Stoves.

T. A. Carew, of Cambridge, Mass., for a Design of a Medallion Likeness of Theodore Parker.

J. D. Marshbank (assignor to himself and W. McConkey), of Lancaster, Pa., for a Design for Stove Doors.

John Polhamus, of New York City, for a Design for the Handles of Spoons, Forks, &c.

H. G. Reed, of Taunton, Mass., for a Design for Tea Service.

J. Steffe and S. H. Sailor (assignor to Cox, Whitman & Cox), of Philadelphia, Pa., for a Design for a Stove.

J. B. Sargent and Purmot Bradford (assignor to J. B. Sargent aforesaid), of New Britain, Conn., for a Design for a Drawer Pull.

N. S. Vedder (assignor to Hicks, Wolfe & Co.), of Troy, N. Y., for a Design for Cook's Stove Plates.

Notes and Queries

W. S., of Ill.—Of two sheet iron pans for boiling sugar juice, each having 16 square feet of bottom surface and a depth of but 4 inches, but the one having straight and the other flaring sides, more juice will be evaporated in the same space of time from that with the flaring sides than from the other, if the sides are exposed to the heat of the fire. But if the bottoms of the two only are exposed, we think the one with the straight sides will evaporate somewhat quicker. Your engine being 13 inches bore, stroke 3 feet and making 50 revolutions per minute, with 80 lbs. on the square inch, will be 36.19 horse power. As your piston runs at the rate of 150 feet per minute, the pressure in the cylinder will be as much as 10 lbs. less than in the boiler, and perhaps double this amount. You can only determine this with a gage. The boiler pressure is taken to be all above the atmosphere.

D. P. N., of Texas.—We have never seen oysters put up in a natural state that were capable of being kept fresh in warm weather for any considerable length of time. In putting up fresh vegetables and meats in air tight cans, the latter are first filled and soldered tight, then they are placed in boiling water with the ends up, when the expanded air inside bulges out the tin. A can is now lifted out, and a small hole is pierced in the end, through which the expanded air escapes from the inside, and the hole is then immediately closed with a piece of solder.

W. I., of Litchfield.—If you desire an answer to your letter you must inform us in what State you reside. You can get a copy of Main's patent by addressing the Commissioner of Patents.

P. C., of England.—Machines for shearing sheep have been patented in this country, and we have illustrated some of them in the back numbers of this journal. We have not heard of the successful introduction of any of these machines into use, although there is great want of a good invention for this purpose.

T. B., of C. W.—We are much obliged to you for your kindness in offering to furnish us with a drawing of the Marquis of Worcester's original steam engine, but we have what is said to be a representation of it in Stewart's rare work on the steam engine. We esteem your obliging offer none the less on this account. We shall re-produce this engraving for publication as soon as we have room for it.

C. C. P., of Ohio.—The liquid which you have sent us, and which you state was obtained from the ground near Athens, is coal oil, and similar to that found in the oil wells of Pennsylvania. It requires to be purified before it can be employed for burning in lamps.

J. H., of Pa.—We do not think there is any need of your publishing anything about your steam plow at present. You cannot help the delay, and whenever you are ready to negociate with parties you can readily make known the fact by advertisement through this paper. We do not think we can possibly attend the trial you speak of, as we are obliged to stand at our post of duty here.

W. J. H., of Ohio.—Clocks for telling the days of the week and month, and names of the month, are common, and have been known for a century. Patents, however, are frequently granted for improvements in such clocks, which are termed calender clocks. We have also seen a contrivance attached to a clock for telling the time in different parts of the world. If you will send us drawings of your invention, we shall be happy to give you an opinion of its patentability.

J. H. P., of Texas.—If you have got air bubbles into your barometer, you will have to pour out the mercury, invert the tube, and fill it again.

W. S. I., of Oregon.—We have no data upon which we can estimate the time required to make a carriage wheel by machinery. We shall be happy to receive your model and act as your agent in procuring a patent for your invention.

C. R., of La.—Your suggestion in regard to an improved paper for the use of magnetic telegraphs is not new. It was carried out many years ago in Bain's chemical telegraph. He used chemically prepared paper, which was marked by the passage of electricity conveyed to it by the point.

E. O., of Va.—We have received the model and description of the improved steam governor, and we are of the opinion that a patent cannot be obtained for it. The principle is so much like Reynold's that a valid claim could not be obtained. You had better have us make a preliminary examination of the water wheel at the Patent Office.

N. R. R., of Ill.—We think our readers have had enough of the crank motion.

A. F. O., of N. Y.—We doubt whether you can produce power by such agency as you speak of as cheaply as it can be produced by coal and water, and doubt whether such an engine can be kept under perfect control. The only satisfactory solution to your question will be a trial.

H. K., of N. Y.—The standard price of 22 carat gold is £3 17s. 10½d. per ounce in England. This is called the mint price of gold in that country, because £3 17s. 10½d. is coined from every ounce of standard gold.

J. W. H., of Iowa.—You cannot weld iridium and steel together. You will find a description of the mode of electrotyping woodcuts and forms of type on page 257, Vol. I. (new series) of the SCIENTIFIC AMERICAN.

E. F., of Maine.—One horse will not be able to drive a 22-inch planing machine. To prevent black ink from molding, put in a little essence of cloves. To make red sealing wax melt 4 oz. of shellac in a bright copper pan, then mix 1¼ oz. of Venice turpentine and add 3 oz. of vermillion.

R. C. B., of Ill.—We are perfectly open to be convinced that friction is not independent of velocity when any well authenticated facts are shown to be inconsistent with the received doctrine.

MONEY RECEIVED

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, Nov. 17, 1860:—

H. T. P., of Mass., $25; H. T. S., of Mich., $30; H. S., of N. Y., $30; J. E. A., of Ill., $10; J. W. S., of Ill., $25; O. S., of Ala., $35; A. C., of N. Y., $30; D. W. S. K., of Ill., $10; G. W. H., of Pa., $25; W. A. H., of R. I., $250; L. & B., of Mass., $30; J. N. P., of N. Y., $30; H. B. W., of Conn., $35; A. M., of N. Y., $350; E. F. F., of Ky., $30; A. J. R., of N. Y., $50; T. S. D., of N. J., $25; S. & S., of Ga., $25; J. G., Jr., of N. Y., $30; V. & K., of N. Y., $25; J. P. S., of N. Y., $73; W. S., of Mass., $25; D. S., of N. Y., $30; W. H. T., of Mass., $30; P. L., of N. Y., $30; C. S., of Ohio, $25; L. F., of Mass., $20; C. R. C., of Cal., $25; D. H., of Ala., $35; W. H. Y., of Conn., $25; D. J. T., of Va., $90; A. & J., of Tenn., $25; J. E. F., of Fla., $55; E. C. T., of N. Y., $25; A. F. F., of Vt., $30; J. P. W., of Ky., $25; W. Y., of Ind., $30; A. I., of Iowa, $30; H. H. R., of N. Y., $30; L. P. T., of N. Y., $150; G. C., of Maine, $55; J. S., of Pa., $10; E. H., of Cal., $25; S. & A., of Iowa, $30; T. B. J., of Ill., $35; F. P., of Tenn., $30; E. B., of Ind., $10; J. A. C., of Ohio, $30; R. F. B., of N. Y., $20; S. & P., of N. Y., $25.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Nov. 17, 1860:—

J. E. F., of Fla.; J. L. F., of Iowa; S. & S., of Ga.; J. W. S., of Ill.; W. S., of Mass.; A. J. K., of N. Y.; J. C. H., of N. Y.; J. G., of Ohio; O. S., of Ala.; E. S., of N. Y.; P. L., of N. Y.; E. C. T., of N. Y.; W. H. Y., of Conn.; A. & J., of Tenn.; H. T. P., of Mass.; T. S. D., of N. J.; G. W. H., of Pa.; J. P. W., of Ky.; V. & K., of N. J.; C. S., of Ohio; E. B., of Ind; E. H., of Cal.; P. J. A., of N. J.; H. B. W., of Conn.; A. M., of N. Y. (three cases).

NEW BOOKS AND PERIODICALS RECEIVED.

THE ATLANTIC MONTHLY for November. Ticknor & Fields, Boston.

The high literary character of this magazine is well sustained.

WARREN'S DESCRIPTIVE GEOMETRY. General problems from the orthographic projections of descriptive geometry; with their applications to oblique, including isometrical projections, graphical constructions in spherical trigonometry, topographical projection ("one plane descriptive"), and graphic transformations. By S. Edward Warren, C.E., Professor of Descriptive Geometry and Geometrical Drawing in the Rensselaer Polytechnic Institute, Troy, N. Y. John Wiley, No. 56 Walker-street, this city.

This is a book of 408 pages, profusely illustrated with diagrams, well engraved, and seems to be a learned and exhaustive treatise.

THE AMERICAN STOCK JOURNAL. Published monthly at No. 25 Park-row, this city. D. C. Lindsley, editor and proprietor.

This is one of the ablest agricultural papers in the country; we never take up a number without finding something valuable in it.

EDINBURGH AND WESTMINSTER REVIEWS. Published by L. Scott & Co., Gold-street.

These two reviews for the present quarter contain quite a number of deeply interesting essays. The "Westminster" contains a review of the life of Robert Owen, and another disquisition on the North American Indians, which are of great interest to all American readers. The "Edinburgh" contains a most able article on "Grotius, and the Sources of International Law." These periodicals contain the essence of European literature.

THE AGE OF HORSES. By Louis Brandt, Veterinary Surgeon, of Indianola, Texas. Published in this city by the author.

This little book, which may be carried in the pocket, contains full directions for telling the ages of horses by their teeth, written in a plain, clear manner, and fully illustrated with 46 wood engravings. From the great number of people who would like to know how to tell the age of a horse with certainty, this work is doubtless destined to have a wide circulation. It is endorsed by Dr. Dodd, the well known veterinary surgeon of Boston. The book can be had of W. F. Heins, No. 21 Nassau-street, this city. Price $1.

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USEFUL HINTS TO OUR READERS.

BACK NUMBERS AND VOLUMES OF THE SCIENTIFIC AMERICAN.—New subscribers to the SCIENTIFIC AMERICAN can be furnished with the back numbers of this volume by signifying their wish to receive them, otherwise their paper will be sent from the date of receiving the subscription. Vols. I. and II. (bound or unbound) may be had at this office and from all periodical dealers. Price, bound, $1 50 per volume; by mail, $2, which includes postage. Price in sheets, $1. Every mechanic, inventor, or artisan in the United States should have a complete set of this publication for reference. Subscribers should not fail to preserve their numbers for binding.

SUBSCRIBERS TO THE SCIENTIFIC AMERICAN who fail to get their papers regularly will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can have them supplied by addressing a note to the office of publication.

GIVE INTELLIGIBLE DIRECTIONS.—We often receive letters with money inclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the Post-office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the Post-office at which they wish to receive their paper, and the State in which the Post-office is located.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was prepaid has expired; and the publishers will not deviate from that standing rule in any instance.

RATES OF ADVERTISING.

THIRTY CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement sent for publication.

GUILD & GARRISON'S STEAM PUMPS FOR all kinds of independent Steam Pumping, for sale at 55 and 57 First-street, Williamsburgh, L. I., and 74 Beekman-street, New York.
1 26 GUILD, GARRISON & CO.

ALCOTT'S CONCENTRIC LATHES—FOR Broom, Hoe and Rake Handles, Chair Rounds, &c.—price $25 and all other kinds of wood-working machinery, for sale by
1 1mtf S. C. HILLS, No. 12 Platt-street, New York.

POCO METALLIC PAINT—POSSESSING ADvantages over all others—viz: varieties of color, finer ground and cheaper. STRATTON & CO., Agents,
20 4* No. 1 Pine-street, New York.

GROVER & BAKER'S SEWING MACHINES do all kinds of sewing with two spools without rewinding and with the only finished and elastic double back-stitch which cannot be harmed by washing and ironing. "We have had one of Grover & Baker's machines in use in our family for some time past, and it is considered the most useful article in the house, next to the cradle, and no less indispensable than that."—SCIENTIFIC AMERICAN. No. 495 Broadway, New York. Send for a circular. 22 6.

COLD IRON BAR CUTTERS.—NO MACHINE Shop, large or small, should be without them. For circulars, address CRESSON & HUBBARD, No. 1,509 Pennsylvania-avenue, Philadelphia, Pa. 22 5*

AN INFALLIBLE GUIDE TO DISCOVER THE age of Horses up to 30 years, with unerring accuracy, can be had by inclosing $1 to the subscriber. The book, containing 46 engravings, and pronounced by the most eminent veterinary surgeons of the United States to be the best ever published on the subject, will be promptly forwarded to any part of the Union and the Canadas on receipt of the above amount. WILLIAM F. HEINS,
1 No. 21 Nassau-street (room No. 4), New York.

TO DYERS AND CALICO PRINTERS.—PROcesses to prepare and use Aniline, Benzine, Niter Benzine, Violet of Aniline, Fuchsine, &c. Price, $5. Address Professor H. DUSSAUCE, Chemist, New Lebanon, N. Y. 1*

BOILERS FOR SALE.—NEW AND SECONDhand Boilers, of all descriptions and completed; also, Boilers taken in exchange. Inquire of or address WM. FINNEY & CO., No. 167 Water-street, Brooklyn, L. I. 22 4*

QUARTZ CRUSHERS OR STONE-BREAKING Machines.—Information wanted of machines fitted for breaking up stone for road purposes. Address J. H. McH., Pikesville, Baltimore county, Md. 22 2*

ROOFING.—THE ADVERTISER BEING about to cover a large dwelling house, wishes information with regard to galvanized iron and other kinds of new roofing material. Address J. H. McH., Pikesville, Baltimore county, Md. 22 2*

LABORATORY OF CHEMISTRY.—CONSULTAtions and advices on chemistry applied to arts and manufactures, agriculture, metallurgy, mining surveys. Information on chemical fabrications, with drawings, such as colors, varnishes, coal oils, paper, gas, candles, soaps, dyeing, animal black, manures, acids, alkalies, salts, india-rubber, gutta-percha, &c. Address Professor H. DUSSAUCE, chemist (from the Conservatoire Imperial of Arts and Manufactures, Paris), New Labanon, N. Y. 1*

GREAT CURIOSITY.—PARTICULARS SENT free. Agents wanted. SHAW & CLARK,
6 21* Biddeford, Maine.

FOR SALE—THREE PIN MACHINES (FOWler's pattern) for making solid head pins—makes Nos. 3, 4 and 5 pins; all new and in good order. Also, one sticker to stick the pins in the paper. Also, one hair-pin machine, capable of making 100 perfect hair-pins per minute; wire straighteners: all the fixtures complete for starting the business. For further particulars address E. IVINS, corner of Fifth-street and Columbia-avenue, Philadelphia, Pa. 19 4*

PORTER'S IMPROVED GOVERNOR.
The reputation of these governors is well established. Parties troubled with unsteady power may send for them in entire confidence. They never fail.
The numerous valves in use are all equally good, if well made; the form of the opening is immaterial. The governors are warranted to work perfectly with any and all valves, which move freely and close tolerably tight.
A style is made expressly adapted to waterwheels, to which they will give a perfect uniform motion, under any variation of resistance.
I have long done with troubling my customers for certificates; but am able to refer to a large number of parties now using this governor in a majority of the States of the Union.
I will send a governor to any responsible party for trial. If it does not operate perfectly it may be returned.
A liberal discount to the trade, whose orders will always be promptly filled.
CHARLES T. PORTER,
No. 335 West Thirteenth-street, corner of Ninth-avenue,
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5.000 AGENTS WANTED—TO SELL FIVE new inventions—one very recent, and of great value to families. All pay great profits to agents. Send four stamps and get 80 pages particulars. EPHRAIM BROWN, Lowell, Mass.
17 13*

BROWN & GARRISON'S AGENCY FOR THE sale of Patent-Rights and all Labor-saving Articles, No 126 Randolph-street (P. O. Box No. 1,219), Chicago, Ill. 20 3*

A GOOD CHANCE FOR MANUFACTURING.—The subscribers have for sale a very valuable property, comprising about 13 acres, suitable for Cotton, Paper or any other manufacturing purposes. There are several large springs of pure Water on the premises. The Building is four stories high, 50x100 feet; the basement walls are 2½ feet thick; the whole building is put up in the most substantial manner. In addition thereto, is an octagon Wheel-house, two stories high, 34x36 feet, containing a large iron overshot Water Wheel, built by Barton, of Troy. Attached to the property are 11 good Dwellings and a Store. The situation of this property is unsurpassed for any manufacturing purposes in the State, and is within fifteen minutes' ride of the Hudson river and one mile of the New York and Erie Branch Railroad. If not sold by the first of January, it will be to rent. This property is now in complete order, and ready for operation. For further particulars, inquire of the subscribers, at Cornwall, Orange county, N. Y.
18 5*eow ORR & CO.

SOMETHING NEW.—JUST OUT, GENTLEmens' Water-proof Cloth Coats, Sporting Coats and Leggings, and a variety of new styles of Water-proof Clothing, from the new factory of the N. Hayward Company. For sale by the New York agent, at No. 181 Broadway. [18tf] SAM. C. BISHOP.

HOUSEHOLD ARTICLE FOR EVERYDAY use—Patent for sale.—A self-soaping Scrubbing Bath or Nail Brush. Can be got up cheap; an excellent opportunity to make money. Patent granted May 22, 1860. Address WM. TUSCH, Box No. 773 New York Post Office. 18

CHARLES A. SEELY, CHEMIST, NO. 424 Broadway, New York.—Analyses of ores, minerals, articles of commerce, &c. Advice and instruction in chemical processes generally; advice on chemical patents. 20 8*

PORTABLE STEAM ENGINES—6, 8 AND 10horse, at $500, $625 and $780. For sale by S. C. HILLS, No. 12 Platt-street, New York. 1 e3w

WANTED—A PARTNER, WITH SEVERAL thousand dollars, in a well-established Foundry and Machinery concern; or I will sell or exchange for an improved Farm said Foundry, Tools, Patterns, &c., with a good run of custom. Location second to none in the United States, especially for Steamboat Machinery. Address F. SIMON, P. O. Box No. 178, Paducah, Ky., or C. SIMON, Agent. 20 3*

WANTED—A SITUATION AS SUPERINtendent in an Iron Foundry, by a man of steady habits, who has had over 20 years' experience as molder. Good reference can be given, if required. Address J. N., Providence (R. I.) Post Office.
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SWISS DRAWING INSTRUMENTS.—CATAlogue (seventh edition), containing over 250 illustrations of Mathematical, Optical and Philosophical Instruments, with attachment of a large sheet representing the genuine Swiss Instruments in their actual size and shape, will be delivered on application to all parts of the United States, gratis, by C. T. AMSLER, No. 635 Chestnut-street, Philadelphia, Pa., established agency for the Swiss Drawing Instruments since 1848. 20 6*eow

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HAYDEN SANDERS & CO., No. 306 PEARLstreet, New York, manufacture every variety of brass work for portable steam engines, whistles, valves, oil cups, gage cocks, &c. 21 13*

SAVE YOUR STEAM.—HOARD & WIGGIN'S Improved Steam Trap Valve, for relieving steam pipes, cylinders, &c., of condensed water. By its use the boiler pressure is kept up, the full heat maintained, and a large saving in fuel made. Several thousand of these trap valves are in successful use, and we offer them with entire confidence that they will accomplish all that we claim for them. For an illustrated circular or a trial machine, address— J. W. HOARD, } Providence, R. I.
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Munn & Co.,
37 Park Row, New-York.

Auf der Office wird deutsch gesprochen.

THE GRAEFENBERG THEORY AND PRACTICE OF MEDICINE.—On the 1st day of May, 1860, the Graefenberg Company's Sales-rooms, Consulting Offices and Medical Institute were removed from No. 34 Park-row to—
No. 2 Bond-street, New York,
(first door from Broadway,) in order to afford greater facilities and a more central location, demanded by the rapid increase of confidence in the Graefenberg Theory and Practice. The Graefenberg Theory and Practice, and the use of their medicines, together with complete symptoms of all diseases incident to this country and climate, the best method for their prevention and cure, will be found in the "Graefenberg Manual of Health."
This valuable family medical work, containing 300 pages, has been revised and improved, and elegantly illustrated with beautifully colored engravings of the human system. Sent by mail to any part of the country, on receipt of 25 cents. It is a complete guide to all diseases and their cure. Address
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One of the leading journals says of the Graefenberg Manual of Health:—"This is the only medical book for family and general use ever published. It is written in plain language, free from scientific terms, and condenses more practical medical information than can be obtained anywhere else, unless a regular medical course of education is undergone. The popularity of this admirable and compendious work is well shown by this being the twenty-fourth edition. It contains a number of colored anatomical plates, and is a complete family physician. It is at once simple, popular, plain and explicit; and the mother, with such an adviser, is prepared at once to apply the proper remedies in case of sudden sickness in the family. In the country, a copy of the 'Manual of Health' is indispensable, and every family should possess one. It will save a hundred times its cost in doctors' bills, and, what is far better, will be the means of preserving many valuable lives to their families and relatives."
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MACHINE BELTING, STEAM PACKING, ENGINE HOSE.—The superiority of these articles, manufactured of vulcanized rubber, is established. Every belt will be warranted superior to leather, at one-third less price. The Steam Packing is made in every variety, and warranted to stand 300 degs. of heat. The Hose never needs oiling, and is warranted to stand any required pressure; together with all varieties of rubber adapted to mechanical purposes. Directions, prices, &c., can be obtained by mail or otherwise at our warehouse. NEW YORK BELTING AND PACKING COMPANY. JOHN H. CHEEVER, Treasurer,
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OIL! OIL! OIL!—FOR RAILROADS, STEAMers, and for Machinery and Burning. Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This Oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough and practical test. Our most skillful engineers and machinists pronounce it superior to and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The SCIENTIFIC AMERICAN, after several tests, pronounces it "superior to any other they have ever used for machinery." For sale only by the Inventor and Manufacturer, F. S. PEASE,
No. 61 Main-street, Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the United States and Europe. 18 13

WOODWORTH PLANERS—IRON FRAMES TO plane 18 to 24 inches wide, at $90 to $110. For sale by S. C. HILLS, No. 12 Platt-street, New York. 1 tf

STOVER MACHINE COMPANY, NO. 13 PLATTstreet, New York—Manufacturers of Stover's Patent Engle Molding Machine, for cutting and planing irregular forms of every description—illustrated in No. 25, Vol. I., SCIENTIFIC AMERICAN—and of the Stover & Coffin Patent Combination Planing Machine—illustrated in No. 19, Vol. II., SCIENTIFIC AMERICAN. Also, all kinds of Wood and Iron labor-saving machinery, Railroad Supplies, &c. &c.
1*

IRON PLANERS, ENGINE LATHES, AND OTHER Machinists' Tools, of superior quality, on hand and finishing, and for sale low; also Harrison's Grain Mills. For descriptive circular, address New Haven Manufacturing Co., New Haven, Conn. 1 26

STEAM HAMMERS.—THE UNDERSIGNED, makers of the celebrated Nasmyth hammers, having a full assortment of patterns, continue to furnish them at reduced prices, and of any size, from 5 cwt. upwards. The large number hitherto made by them, and in successful operation, precludes the necessity of presenting any recommendations. They are also patentees and exclusive makers, for this country, of what is generally known as the "Condie," or inverted hammer, one of which of six tons, falling six feet, has been in operation at the Franklin Forge, New York, since 1849. [1 eowtf] MERRICK & SONS, Philadelphia.

SOLID EMERY VULCANITE.—WE ARE NOW manufacturing wheels of this remarkable substance for cutting, grinding and polishing metals, that will outwear hundreds of the kind commonly used, and will do a much greater amount of work in the same time, and more efficiently. All interested can see them in operation at our warehouse, or circulars describing them will be furnished by mail.
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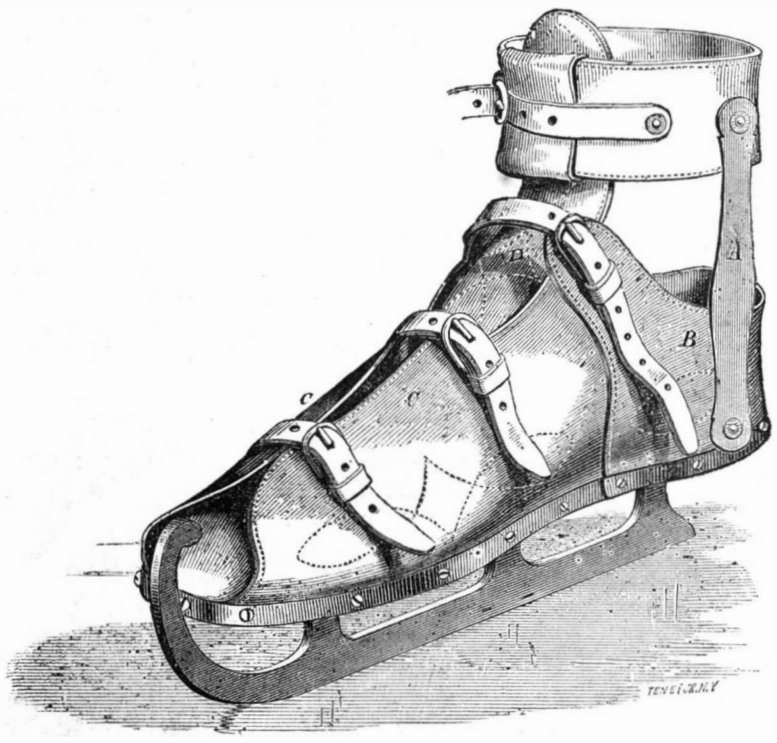
A FEW FACTS ABOUT CELEBRATED MEN.

Some literary men make good men of business. According to Pope, the principal object of Shakespeare in cultivating literature was to secure an honest independence. He succeeded so well in the accomplishment of this purpose that, at a comparatively early age, he had realised a sufficient competency to enable him to retire to his native town of Stratford-upon-Avon. Chaucer was in early life a soldier, and afterward a commissioner of customs and inspector of woods and crown lands. Spencer was secretary to the Lord Deputy of Ireland, and is said to have been shrewd and sagacious in the management of affairs. Milton was secretary to the Council of State during the Commonwealth, and gave abundant evidence of his energy and usefulness in that office. Sir Isaac Newton was a most efficient Master of the Mint. Wordsworth was a distributor of stamps; and Sir Walter Scott a clerk to the Court of Session—both uniting a genius for poetry with punctual and practical habits as men of business. Ricardo was no less distinguished as a sagacious banker than a lucid expounder of the principles of political economy. Grote, the most profound historian of Greece, is also a London banker. John Stuart Mill, not surpassed by any living thinker in profoundness of speculation, lately retired from the examiner's department in the East India Company, with the admiration of his colleagues for the rare ability with which he had conducted the business of the department. Alexander Murray, the distinguished linguist, learned to write by scribbling his letters on an old wool-card with the end of a burnt heather-stem. Professor Moor, when a young man, being too poor to purchase Newton's "Principia," borrowed the book, and copied the whole of it with his own hand. William Cobbett made himself master of English grammar when he was a private soldier on the pay of sixpence a day. The edge of his berth, or that of his guard-bed, was his seat to study in; a bit of board lying on his lap was his writing table; and the evening light of the fire his substitute for candle or oil. Even advanced age, in many interesting cases, has not proved fatal to literary success. Sir. Henry Spelman was between fifty and sixty when he began the study of science. Franklin was fifty before he fully engaged in the researches in natural philosophy which have made his name immortal. Boccacio was thirty-five when he entered upon his literary career; and Alfieri was forty-six when he commenced the study of Greek. Dr. Arnold learned German at forty, for the sake of reading Niebuhr in the original. James Watt, at about the same age, while working at his trade of an instrument maker in Glasgow, made himself acquainted with French, German and Italian in order to peruse the valuable works in those languages on mechanical philosophy. Handel was forty-eight before he published any of his great works. Nor are the examples of rare occurrence in which apparently natural defects, in early life, have been overcome by a subsequent devotion to knowledge. Sir Isaac Newton, when at school, stood at the bottom of the lowermost form but one. Barrow, the great English divine and mathematician, when a boy at the Charter-house School, was notorious for his idleness and indifference to study. Adam Clarke, in his boyhood, was proclaimed by his father to be a grievous dunce. Even Dean Swift made a disastrous failure at the university. Sheridan was presented by his mother to a tutor as an incorrigible dunce. Walter Scott was a dull boy at his lessons, and while a student at the Edinburgh University received his sentence from Professor Dalzell, the celebrated Greek scholar, that "dunce he was, and dunce he would remain." Chatterton was returned on his mother's hands as "a fool, of whom nothing could be made." Wellington never gave any indications of talent until he was brought into the field of practical effort, and was described by his strong-minded mother, who thought him little better than an idot, as fit only to be "food for powder."

IMPROVED SKATE AND ANKLE BRACE.

The skate illustrated in the annexed engraving is the combined invention of J. F. Blondin (the celebrated rope walker), Frank Douglas, N. H. Spofford and J. B. Hernshoof, all of whom applied for separate patents on the invention about the same time. An interference was declared at the Patent Office, but before the day appointed for opening the evidence in the case, the several parties compromised the matter between themselves, and the Patent was issued on Oct. 2, 1860, to Mr. Blondin, assignee to himself and all the other parties named above.



IMPROVED SKATE AND ANKLE BRACE.

Two brass plates, one, A, on each side, are fastened to the heel of the skate by pivots at their lower ends, and at their upper ends also by pivots to a broad leather strap, which passes around the leg above the ankle joint. While this arrangement allows all the freedom of motion requisite to the foot, it prevents that side turning of the ankle joint, which causes the greatest fatigue in skating and is the principal difficulty with beginners.

The straps for fastening this skate, besides being remarkably secure, operate as an extra clothing to the foot, preventing that coldness of the feet which is the principal discomfort in this delightful exercise. These are shown so plainly in the cut as hardly to require a description. The heel strap, B, is in the form of the counter to a shoe, the two pieces, C C, cover the sides of the foot, and the tongue, D, passes from the toe over the top of the foot, under all the narrow straps, to prevent these from pressing in a way to produce pain or injury.

Messrs. Douglas, Rogers & Co., Norwich, Conn., manufacture the skate, and to them inquiries should be addressed.

WINTERING YOUNG STOCK.

We extract the following from a communication of a practical farmer, addressed to the *Mark Lane Express*:

"Of all the departments of management connected with the breeding of cattle, few give the breeder so much anxiety as the rearing and subsequent care of his young stock. This is peculiarly the case in districts not altogether applicable to breeding purposes, and yet cannot well be appropriated to better uses. Young cattle cannot endure cold rimy frosts for any length of time; it causes scouring. The loss of condition in a short time is often surprising. My usual remedy is the change of food, dry warm bed, and a few doses of thick wheaten-flour gruel, with a little laudanum in each. The issue is very precarious; I always think it a poor prospect, when I am obliged to resort to medicinal treatment for any animal. Young stock should, as a rule, be safely housed in warm sheltered yards before cold or frosty weather sets in; the youngest and most delicate must be provided for in covered hovels, airy, but well shut in. Warmth to a young animal is equal to a moderate supply of food. The stronger animals may do well in the yards, provided the yards be warm, and have open hovels for them to retire to in wet and stormy weather. The great question arises: How are they to be best and most profitably wintered? There probably is no better way to promote condition and healthiness than to feed them on good meadow hay, and to give with it a moderate allowance of oil cake. This will ensure progress and a healthy constitution. The common white-fleshed turnip, when well grown and sliced, is excellent food in the early winter, and if a quantity of the leaves could be given along with the bulbs, all the better; the leaves promote the sounder and freer growth of the bone in all young animals. With this kind of food a little barley or oats should be daily given; of course, cut chaff or hay, or even a great superabundance of good straw for the young stock to browse over, is to be included as food. Roots will never do alone; in all cases dry cereal food is desirable, if not absolutely necessary. Much has been written about the necessity of exercise for young animals. It certainly does appear to be right, if necessary to promote growth and vigor. Taking all into consideration, however, I prefer the plan of tying up, with an occasional run into the yard in suitable weather." The experience of a stock raiser given above is worthy of attention by all our farmers.

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